

DOCUMENT RESUME

ED 052 488

24

CG 006 497

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TITLE The Construction and Implementation of a Data Base.
Information System for Vocational Decisions.
INSTITUTION Harvard Univ., Cambridge, Mass. Graduate School of
Education.
SPONS AGENCY Office of Education (DHEW), Washington, D.C.
REPORT NO PR-30
BUREAU NO BR-6-1819
PUB DATE Apr 70
GRANT OEG-1-6-061819-2240
NOTE 216p.

EDRS PRICE MF-\$0.65 HC-\$9.87
DESCRIPTORS Career Planning, Computer Programs, Computers,
Computer Storage Devices, *Data Collection,
Educational Technology, *Information Networks,
*Information Storage, *Information Systems, *Man
Machine Systems, Occupational Information,
Programing Languages

ABSTRACT

Three operations relevant to preparing a data base and supporting scripts are discussed in considerable detail. Section One enumerates the activities which constitute the collection and documentation of a data base. The material presented is relatively nontechnical and requires no knowledge of computers. Section Two discusses the preparation of the data for the computer and the running of the Information System for Vocational Decisions (ISVD) programs that process data bases. A third area of operation is the script network, which is used to interface the data with the inquirer. The writing of a preference script and the preparation of its documentation is the subject of Section Three. (TL)

ED052488

INFORMATION SYSTEM FOR VOCATIONAL DECISIONS

Project Report No. 30

THE CONSTRUCTION AND IMPLEMENTATION OF A DATA BASE

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This paper was supported in part by Grant No. OEG-1-6-061819-2240
of the United States Office of Education under terms of the
Vocational Education Act of 1963.

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April 1970

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THE CONSTRUCTION AND IMPLEMENTATION OF A DATA BASE

Patricia Yee
Richard Allan Roman
Priscilla A. Little
David K. Archibald

There are at least three operations which take place in the preparation of a data base. One may be described as the collection and documentation of data. Another concerns the preparation of data for entry into the computer, and, subsequently, the running of programs. A third area of operation is the script network, which will be used to interface the data with the inquirer. The time spent in collecting and documenting the data and scripts is more than repaid when it comes to preparing the data for entry to the computer and running the programs, for the speed with which the data is processed depends almost entirely on the quality of the documentation.

Figure 1 presents a schematic diagram detailing, from reference collection to final implementation, the activities involved in preparing a data base and supporting scripts. Some of these activities are discussed in this paper, but not necessarily in the order outlined in the diagram. Reference to Figure 1 will clarify where each activity fits into the overall procedure.

Activities proceed from left to right across the diagram. No activity (represented by a line) can start from a state (represented by a number) until all activities entering that state are completed. As an example, none of the activities 5-25 (code data), 5-20 (code all lists), 5-46 (prepare list of lists), 5-27 (assign physical names), or 5-36 (dummy activity*) can begin until both 4-5 (type data formats) and 7-5 (type codes) are complete.

Two parts of Figure 1 will be discussed in the next two sections. Detailed in the first section are those activities that constitute the collection and documentation of a data base. The material presented is relatively non-technical and requires no knowledge of computers. The activities could guide the construction of any data base, whether for ISVD or not.

* Dummy activities take no time and imply only that another activity is complete.

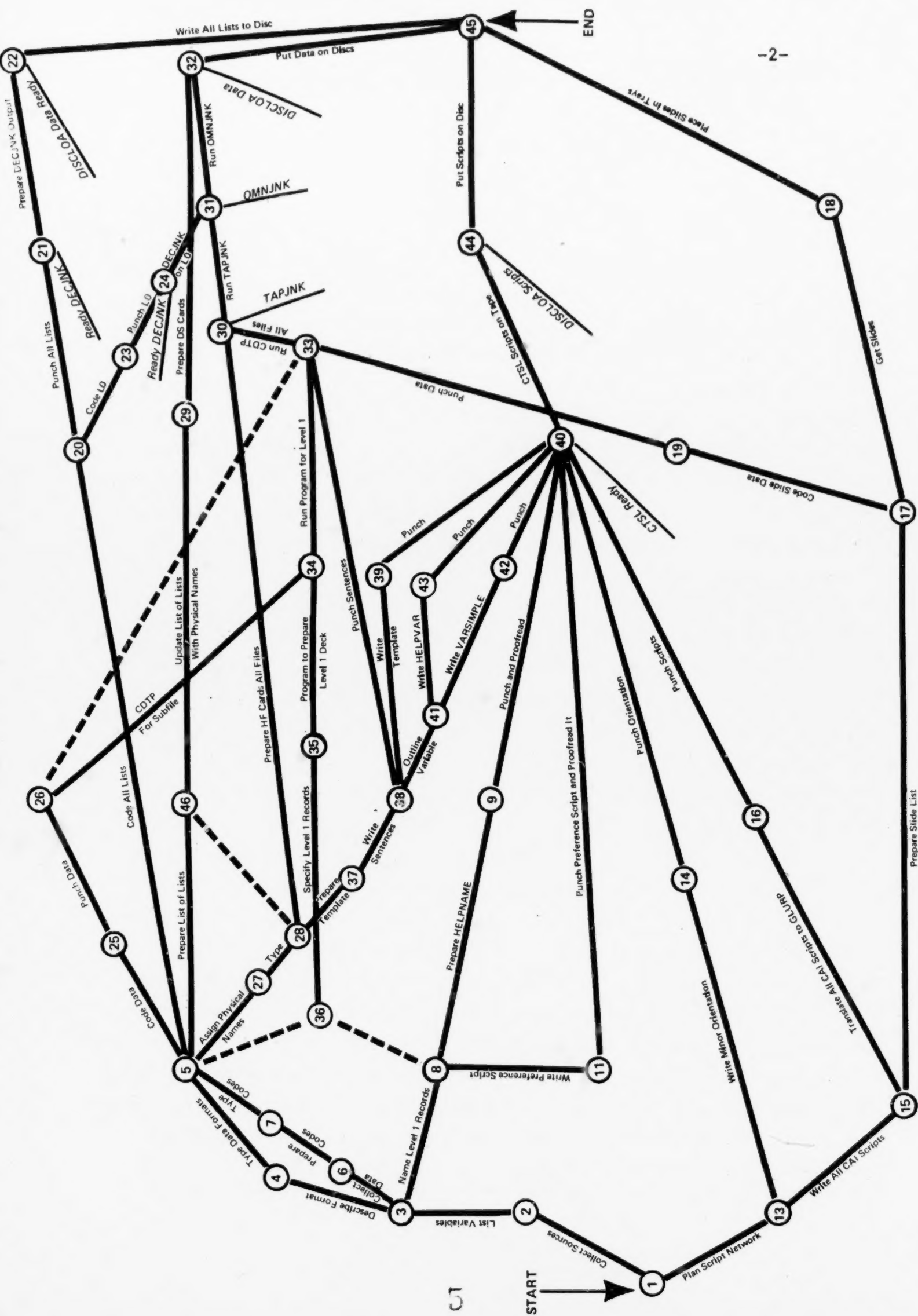


FIGURE 1. PREPARING A DATA BASE AND SUPPORTING SCRIPTS

The second section will discuss the preparation of the data for the computer and the running of the ISVD programs that process data bases. The presentation there is more technical, but details of internal processing are not discussed. The document on system design by Roy Norris will provide those details for anyone who is interested.

The third area related to data base construction is that of scriptwriting. The writing of a preference script and the preparation of its documentation is the subject of section 3. Additional information about scriptwriting may be found in project reports, "The Script Network" and "Storage in ISVD."

Section 1

THE COLLECTION AND DOCUMENTATION OF DATA FOR THE CONSTRUCTION OF A DATA BASE

This section is concerned with the first stage of operation, the collection and documentation of data. In this phase, the work can be categorized into these series of actions, to be discussed subsequently:

- (A) Defining the Data
- (B) Constructing the Template
- (C) Coding the Data
- (D) Preparing the Documentation

Defining the Data

Because the information finally given by the machine will be no better than the source information, the first task is to collect as many relevant references as possible (activity 1-2, Figure 1). It is wise at this point to do some cross-checking of the sources, and especially to contact other individuals or places currently involved with the subject matter of the data base. Sources referenced for the Occupation, Education, and Military Data Bases of the ISVD are listed in Appendix A.

Establishing a list of variables for which data will be coded is the next activity (2-3, Figure 1). A variable for our purposes is a group name for which each member of the group has its own value. For instance, 'tuition' is a variable, each school has a tuition, but the amount differs. Ideally, all the data possible should be included in the system. However, the amount of computer space available, as well as time and financial resources, limit the actual amount of data collected. At the prototype stages, it was decided to gather as representative a sample of variables as possible for the Information System. Those listed for the Military Data File are shown in Table 1.

One of two methods for listing these variables may be employed. The first is to decide beforehand what information is eventually to be

TABLE 1
Military Data File Variables

1. Availability for Women
2. Chart Number for Navy List
3. Places of Work
4. High School Courses
5. Prior Experience
6. Abilities, Aptitudes, Traits - Navy, Air Force
7. Areas of Study - Navy
8. Navy Specialties
9. Service Schools - Navy
10. Related Civilian Jobs - Navy
11. Related Navy Jobs
12. Knowledge and Skills Gained - Air Force
13. Specialized Air Force Jobs
14. Related Civilian Jobs - Air Force
15. Related Civilian Jobs - Army
16. Mental Requirements - Army
17. Physical Requirements - Army
18. Knowledge and Skills Gained - Army
19. Specialized Army Jobs
20. Personnel Requirements - Army

printed out by the machine and then to check the sources to see how much of the desired information is available. Another, and perhaps more efficient, way -- especially when the available sources are limited -- is to survey the references, or a representative sample, and then make a list of those variables that are most generally found for each source. If the source information is in different formats, this is the time to decide on the best order for gleaning the data from the sources. The subject of the data base may be one for which there are already available reference sources that have categorized the information into standardized headings. This, of course, alleviates the need to cull the original sources and makes the listing of variables an easier task. Such was the case for the College Data File (see Appendix A).

Another step that is helpful at this point, both in defining the variable and in writing the template is to group these variables into larger categories of information, which eventually will form paragraphs. An example category is listed below.

Category Heading: Entrance Requirements
education requirement
high school subjects
age requirement
other entrance requirements
number of recommendations
application fee
refundable or nonrefundable
other fee
amount of fee
fee due date
interview

This is helpful in clarifying the variables, for often the variables first listed will turn out after examination to contain more than one variable.

Constructing the Template

Concomitant with the listing of variables is the task of constructing a preliminary plan for a template (activity 28-37, Figure 1). This is necessary before there can be further formatting specifications since the coding of the data is dependent on the context in which it is placed in the template.

Based on the Wolff paper entitled A Procedure for Writing Job Descriptions by Computer (see Appendix B), a template may be prepared for

any one of the data bases for which variables have been defined. The template, consisting of a paragraph or a series of paragraphs, provides the structural framework for decoding and presenting the information. After the specific school, occupation, etc. has been determined, then the appropriate information is selected from the data encoded on cards and substituted in the template. A good beginning point in writing a template is to take each major information category and structure it into a paragraph or a segment of a paragraph. A template and an example description from the Trade School Data File are shown on the following pages. The underlined information in the example description is variable for each school. Templates for the other ISVD data files may be found in Appendix B.

TRADE SCHOOL FILE
TEMPLATE I

(Record name), a (private or public), (profit or non-profit), (religious affiliation), (student body composition) institution established in (year established), is located at (address). Preparing students for a career in (focus of school), the school offers a (duration of program) program leading to a (type of degree). It is (accreditation) by the (accreditation body)

(Subjects or majors) are (specific subjects/fields). On-the-job training (on-the-job training) a part of the program. To graduate, (units for graduation) (specification of units) or (units for graduation) (specification of units) are required, a credit hour being (credit hour definition) hours of instruction. A joint study program with (college or j.c. affiliation) enables students to enroll for courses leading to a (type of degree). For further information, refer to the (college or j.c. affiliation) description in the (data base) Data Base. (Other programs) are available.

The school (placement office) a placement office for its students. The basic entrance and application requirements of (record name)

are:

- You must (education requirement) and have taken (h.s. subjects).
- You should be (age requirement) years old.
- You need to submit (other entrance requirements) and (number of recommendations) letters of recommendation.

A personal interview is (interview). An application fee of \$ (application fee) should accompany the application. A (refundable or non-refundable) (other fee) fee of \$ (amount of fee) must be submitted (fee due date). Students may apply for classes which begin (enrollment dates).

Total expenses for (expense coverage) are approximately \$ (total cost). This includes tuition of \$ (tuition) (credit hour), (room and board) fees of \$ (room and board fees), textbooks, \$ (textbook expenses), (uniforms), (other costs), \$ (other cost total), and (other costs), \$ (other costs total). Out of state residents must pay an additional \$ (non-resident tuition) for tuition.

Dormitory facilities (availability of dorm facilities) provided for (dormitory residents). (Housing stipulations). (Number of scholarships) (type of scholarship) scholarships are awarded (frequency of awarding) on the basis of (basis for awarding). Loans of (amounts of loan) (loan availability) from (loan program titles).

(Record name) has approximately (student body size) students and (faculty size) faculty members. Extracurricular activities include (extra-curricular activities).

For further information, contact (contact person).

TRADE SCHOOL FILE

EXAMPLE DESCRIPTION OF TEMPLATE I

Central Vocational Technical Institute, established in 1963, is located at 1250 Turner Street, Auburn, Maine 04210. Preparing students for a career in industrial technology, the school offers a two year program leading to a diploma. It is approved by the State Board of Higher Education for the training of veterans.

Some of the major fields of study offered are auto mechanics, practical electricity, technical drafting and design, machine tool operation, and printing and graphic arts. On-the-job training is not a part of the program. To graduate, 2160 hours are required.

The school, as far as can be determined, does not maintain a placement office for its students.

The basic entrance and application requirements of Central Vocational Technical Institute are:

- You must complete high school or the equivalent.
- You should be 17 years old.
- You need to submit a high school transcript, transcripts of any post-secondary work, a health certificate, and 2 letters of recommendation.

A personal interview is required. An application fee of \$ 5 should accompany the application. Students may apply for classes which begin September.

Total expenses for one year are approximately \$ 924. This includes tuition of \$ 247, room and board fees of \$ 582, supplies, \$ 65, and other fees, \$ 30. Out of state residents must pay an additional \$ 176 for tuition.

Dormitory facilities are provided.

Loans are available from banks participating in the N.V.S. Loan Insurance Act program.

Central Vocational Technical Institute has approximately 180 students.

Sentences in the template may present coded information for one or more variables. A single variable sentence is often used where a series of several items of information may be listed for a variable. For instance, the template sentence, "---Extracurricular activities include (extracurricular activities).\" might read

"Extracurricular activities include intramural sports, glee club, band, student government, academic clubs, and drama".

This is the simplest form of a template sentence for if no information is coded for the variable, then the entire sentence is omitted. Although a sentence which strings together several variables affords a more interesting and succinct presentation of the facts, it requires a greater number of complex template specifications for the computer. These specifications may refer to grammatical changes, capitalization, the addition or deletion of punctuation, or the omission of words, clauses, or sentences from the description. Listed on the following page are some example rules from the Trade School File.

TRADE SCHOOL FILE
EXAMPLE RULES FOR TEMPLATE I

The symbol "ç", as used here, indicates that no information is coded for the variable in question.

Grammatical Changes

1. If 'number of recommendations' is coded 1, then change
"letters of recommendation" to "letter of recommendation."
2. If there is information for only one of the following variables,
'education requirement'
'h.s. subjects'
'age requirement'
'other entrance requirements'
'number of recommendations'
then change the lead sentence of the paragraph to read,
"The basic entrance and application requirement of (record name) is:"

Formatting

1. If 'location' is coded for more than 3 addresses, put the addresses in list form with a double space between each entry.

Omit a Phrase or Clause

1. If 'private or public', 'profit or non-profit', 'religious affiliation', 'student body composition' are all coded ç, then omit
"a (private or public), (profit or non-profit), (religious affiliation), (student body composition) institution"
2. If 'year established' is ç, then omit
"established in (year established)"

.
.
.

Capitalization and Punctuation

1. If 'focus of school' is ç, begin the sentence
"The school offers a (duration of program) program leading to a (type of degree)."

.
.
.

In formulating the template, one is searching for an attractive and literate presentation of the data, but not one that has much excess verbiage in it, since the inquirer will only be bored by repeatedly seeing an obviously identical sentence structure in which only the information has been changed. The fact that the computer can construct sentences is impressive by itself, but one should attempt to avoid as much as possible being obtrusive about the way the sentence is constructed.

For instance, note that the only words the example sentences below have in common are: "in", "has a", "opening for a(n)", "of", and "and". Generally there will be many more words that are constant in a template description, but this is a particularly good illustration because much information is given and the several examples of the same sentence can be printed out with minimum repetition of the duplicated words.

1. Harvard University in Cambridge, Mass. has a June 1, 1969 opening for an Assistant Professor of Guidance and General Education.
2. Brown University in Providence, Rhode Island has a September 1, 1969 opening for a Professor of Logic and Metaphysics.

Because of the nature of the data and the reference sources, several templates may be prepared for a data base to afford the inquirer a greater depth, detail, and range of information as well as to provide for varying language, reading comprehension, and interest levels. However, the use of a multiplicity of templates may involve a greater complexity in the documentation and the formulation of coding specifications.

Coding the Data

In planning the coding of the data, there are several aspects to consider: the form of coding to employ (activity 6-7, Figure 1), the coding format (activity 3-4), the organization of the lists (also included in 6-7), and the coding (activity 5-25) and keypunching (activity 25-26) of the data.

Forms of Coding

Coding may be done in three ways, by spelling it out directly on cards, entering it on a list, or employing a quasi-list form.

Direct Coding

This form of coding is used when data for a variable is different in each case or in the vast majority of cases. Because the coding is spelled out directly on cards, it is processed more quickly by the computer than data coded on lists. Documentation is also kept to a minimum.

Direct coding is of two types: alphabetic and numeric. The first applies to any letters or numbers such as names and addresses, and the second, only to numbers. Items such as, "29 Constant Street, Cambridge, Mass. 02138" or "The School of Fashion Design" are alphabetic. Numeric coding means that data are all numbers. The 'percentage of students working', 'year founded', 'number of male full-time undergraduates', and 'tuition per year in dollars' are some of the variables from the College File that are coded numerically.

List Coding

The list form of coding employs a two step procedure. Data punched on the card can not be read directly. Instead they refer to a value in a specific list. The entry by that value supplies the meaning of the code. To interpret the coded numbers on the cards, the computer has to access a specific list and then translate the codes.

A typical list would encode high school courses required for entrance to college:

List 10 - H.S. Subjects

- 01 English
- 02 General Math
- 03 Algebra
- 04 Chemistry
- 05 Astronomy
- 06 Plumbing
- 07 Cooking
- 08 Dramatics
- 09 Social Dancing
- 10 Psychoanalysis
- 11 Journalism
- 12 Debate
- .
- .
- .

Instead of spelling out the names of the courses on data cards, the number would be punched.

There are several advantages to using a list. First, it enables the data to be standardized for general referencing and allows the same list to be used for several variables. Because coding in this form takes up much less space on the cards, a series of items may be listed for a particular variable. In addition, updating is more easily facilitated. Another advantage is that additions and deletions can be made to a list as the work progresses which eliminates the necessity for knowing all the possible options for a variable before coding begins. Finally, there is flexibility in the form of presentation since entry items may range from single words to clauses and phrases or entire sentences. For instance, a variable list called 'Other Salary Qualifications' might be comprised of entries in the form of sentences. If the field for this variable was coded, for example, with the number 108, the computer would print out that sentence at the appropriate time.

List 38 - Other Salary Qualifications

<u>Code</u>	<u>Meaning</u>
.	
.	
.	
108	In addition, there is a \$300 a month housing allowance.
109	A liberal housing allowance is granted.
.	
.	
.	

In making up a list, each item must be worded so that it is consistent with the specific sentence in the template. Note below how the phraseology of the example entries from the 'H.S. Subjects' list of the Trade School File meshes with the template sentence, "---You must complete high school and have taken (h.s. subjects)."

List 50 - H.S. Subjects

<u>Code</u>	<u>Meaning</u>
01	as much basic science as possible
02	at least 1 year of math
03	3 or 4 years of English

.
.
.
06 algebra
07 geometry
.
.
.

Character Binary Coding

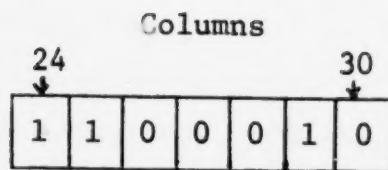
Although a list is referenced in character binary coding, interpretation of the coding is of a different nature. In character binary coding, the list options are specified before the coding can begin, and the variable is coded in a contiguous set of columns with the width equal to the number of options on the list. Each listed item is associated with a specific column. For instance, the variable 'Foci of School' in the College File is coded from columns 24 to 30 on card 1, with the options listed in the following order.

List 82 - Foci of School

- 1 Liberal Arts
- 2 Teachers Preparation
- 3 Professional
- 4 Technical
- 5 Agricultural
- 6 Fine Arts
- 7 University

In this example, column 24 refers to item 1, liberal arts. Column 27 refers to item 4, technical. The column on the card has a "1" punched if the school has the relevant focus. If not, a "0" is punched.

Data is coded in the binary mode, with "1" indicating that data is present for the school, and "0", that it is not. To interpret the character binary, whenever the digit "1" appears, its particular position in the variable field is noted, and the appropriate option is decoded from the list. If 'Foci of School' was coded "1" in columns 24, 25, and 29 and "0" in the remaining columns, this would indicate that the college in question has programs in the areas of liberal arts, teacher preparation, and fine arts.



The advantage of character binary coding is that one can code for all options in the field. In list coding, the variable field is limited to a specific number of items. Binary coding also saves a considerable amount of space once the data is in the computer.

Coding Format

Once the variables are listed, then the coding format for the data can be specified (activities 3-4 & 4-5, Figure 1). Describing the format is a further definition of the variables, and the point at which we begin thinking specifically of cards, coding positions, and coding forms.

In planning the coding format, it is necessary to think in terms of fields, the particular number of spaces that can hold the longest value for each variable, whether this data is spelled out on the card itself or coded on a list. The schools, occupations, etc. for which information is classified in the data base are referred to as record names. Listed below are a few examples from the College File.

List 1 - Record Names

Codes

001	Central Connecticut State College
002	Danbury State College
003	Hartford State Technical Institute
004	Manchester Community College
005	Northwestern Connecticut Community College
.	
.	
.	

If list coding is employed, determine the length of the field by using the following guidelines, and then make up a "list" of the codes to be referenced. For a two-digit field, the maximum number of codes available is 99; for a three-digit field, 999; for a four-digit field, 9999; and so forth. For example, if there were approximately 300 job titles and additions were expected to total no more than 100, then a field of three spaces would be sufficient.

The maximum number of items to be coded for a particular variable is determined by the nature of the variable, its relative significance, the structure of the template sentence, the length of the coded data, and the reference sources. The number of spaces designated on a code sheet for a variable, therefore, is contingent on the maximum number of items to be coded and the field length of the variable. For example, if a maximum of five courses are to be coded for the variable 'High School Courses Required', and the field length is 3 digits, then a block of 15 spaces would be assigned for the variable.

In instances where a list is being coded as the sources are referenced, there is the possibility that the number of entries may exceed the planned variable field. A limited number of additions may be provided through the use of alphabetic letters and/or other characters, as shown below. This causes more work when the data is prepared for computer input and should be avoided if possible.

List 14 - Education

<u>Codes</u>	<u>Meaning</u>
1	complete junior high school
2	graduate from an academic high school
3	graduate from a vocational high school
.	
.	
.	
9	complete graduate or professional school
A	complete high school or the equivalent
B	complete at least the 10th grade of high school or the equivalent

When using alphabetic codes, allow enough spaces for all necessary punctuation and for the possibility of very lengthy numbers or names and addresses. No matter what form of coding is employed, it is best to be generous when planning the variable field, for it is difficult later to expand the field.

In setting up for the format (activity 3-4, Figure 1), the record numbers are entered first on each card, followed for identification purposes by the card number (if there is more than one). The variables then are listed in the order helpful to the people doing the coding, for the

sequence in which the data goes on the cards can speed up the actual coding. An example coding format is given in Table 2.

List Organization

Once the coding format is established, then some thought should be given to the possible internal organization of the lists. Whether the lists are classified by alphabetical order or another system, an internal ordering will assist the person doing the coding to locate the particular code he wants or to classify new entries (activities 6-7 and 7-5, Figure 1). Also, the specification of level 1 records (activity 36-35) will be facilitated. If the data base is to be relatively static, then each list may simply be alphabetized, or categorized according to another scheme, and then numbered sequentially. If you are providing for on-going updating, systematize the numbers so that as additions are made, they will be within a structured framework. Table 3 shows the organization scheme employed for listings in the Occupation and Industrial Forecasting Bibliography. Once the lists are organized, each is assigned a separate and unique number and given a title, generally that of the variable name.

Many lists will be of a two option variety, with "0" and "1" indicating the two options, and "c", no information available. When coding for "no information", a symbol should be used rather than a blank space, for a blank signifying "no information" can not be differentiated from a keypunching error. This list (because it contains one digit and takes up a one-space field) can, if necessary, be extended to the code 9. An example of a two option list is given below.

List 2 - Private or Public

<u>Code</u>	<u>Meaning</u>
0	public
1	private

Coding and Keypunching the Data

After the format and list specifications have been determined, the data is ready to be transferred from the reference sources to the code sheets (activity 5-25, Figure 1), which may be regular programming pads 80 columns wide or hand-designed sheets if the number of cards or the amount

TABLE 2
Coding Format
HGSE Placement Data File

Field Name	Position		Present Codes
	Card	Column	
Record Number	1	1-3	001-999
Card Number	1	4	1-3
Employer Number	1	5-7	001-800
Position Number	1	8-9	01-99
Name of Employer	1	10-52	Alphabetic
City or Town	1	53-71	Alphabetic
State or Foreign Country	1	72-73	01-99
Zip Code	1	74-78	00000-99999
Position Type	1	79	1-9
Position Level	1	80	1-9
Position Title	2	10-12	001-999
Position Field 1	2	13-15	001-999
Position Field 2	2	16-18	001-999
Salary Given	2	19	Δ,1,0
Yearly Salary in 100's of Dollars	2	20-24	00000-99999
Percent of Yearly Salary for Summer School	2	25-26	ΔΔ,00-99
Other Salary Specification	2	27-28	01-99
Metropolitan Area	2	29-30	01-99
Lowest Grade Level Involved	2	31-32	Δk,01-20
Highest Grade Level Involved	2	33-34	Δk,01-20
Minimum Years Teaching Experience Desired	2	35-36	00-99
Minimum Years Administrative Experience Desired	2	37-38	00-99
Minimum Years Other Experience Desired	2	39-40	00-99
Minimum Education Required	2	41-42	00-99
Month Vacancy Opens	2	43-44	01-12
Day Vacancy Opens	2	45-46	ΔΔ,01-31
Year Vacancy Opens	2	47-48	69-99
Normal Teaching Hours Per Week	2	49-50	ΔΔ,00-40
Certification Required	2	51	Δ,1,0
Waiver Available	2	52	Δ,1,0
Contact Person Name	2	53-80	Alphabetic
Contact Person Title	3	10-44	Alphabetic
Street Address	3	45-64	Alphameric
Contact City or Town	3	65-66	01-99
Contact Zip Code	3	67-71	00000-99999
Benefits 1	3	72-73	000-999
Benefits 2	3	74-75	000-999
Benefits 3	3	76-77	000-999
Benefits 4	3	78-79	000-999

TABLE 3

Organization and Identifying Number for References

<u>Category: Government Publications</u>	<u>Identifying Numbers Alloted</u>
Greater Boston Chamber of Commerce	0001-0500
Commonwealth of Massachusetts	0501-1000
U.S. Department of Commerce	1001-1500
U.S. Department of Health, Education, and Welfare	1501-2000
U.S. Department of Labor	2001-3000
Other U.S. Government Departments	3001-3500
Additional Government Publications	3501-4500
<u>Category: Periodicals</u>	
Boston Business Conditions	4501-4600
Occupational Outlook Quarterly	4601-4700
New England Business Review	4701-4800
Employment Service Review	4801-4900
Monthly Labor Review	4901-5000
Additional Periodicals	5001-5200
Extra Listings for above categories	5201-6000
<u>Category: Author (by initial of last name)</u>	
A	6001-6200
B	6201-6400
C D	6401-6600
E	6601-6800
F G H I	6801-7000
J K	7001-7200
L	7201-7400
M	7401-7600
N	7601-7800
O P Q R S	7801-8000
T U V W X Y Z	8001-8200
No Source	8201-8400
Additional Authors	8401-8600
Extra Listings for all categories	8601-9999

of information to be transferred is small. The code sheet is in the form of a matrix, with the record name codes running vertically and the variables running horizontally. Examples of three completed code sheets are shown in Figure 2. For cards 1 and 2 the variables are identified. Card 1 gives the record name code for the school; card 2, the address and coded data for 'State Location' and 'Number of Addresses'.

The coded sheets are passed to the keypunch operator for keypunching upon completion of the coding or as it is progressing (activity 25-26, Figure 1). When this operation is finished, the raw data is ready to be put into a form that can be recognized and used by the computer. Before the data base can be implemented to the point where it is accessed by the inquirer, however, other documentation is necessary.

Preparation of Documentation

To accompany the coded data, the following documentation needs to be prepared:

- (1) list of lists (activity 5-46, Figure 1)

This document is simply a list which includes the names and numbers of all the lists. An example is shown in Table 4. Variables not included on this master list are those for which data is spelled out directly on cards. The list of lists enables a person (or computer) to decide which list to use to interpret a data entry on the cards.

- (2) list of physical names of variables (activity 5-28, Figure 1)

Physical names are assigned to variables by removing all vowels from the variable name and specifying up to a maximum of eight letters for the physical name. The format is:

<u>Logical Name</u>	<u>Physical Name</u>
Top of Salary Range	TPFSLRYR
Number of Years Experience	NMBRFYRS

This specification is necessary for the formulation of HF cards and for the implementation of the template. The shorter names save space in the machine.

- (3) final template (activity 28-37, Figure 1)

The final template is prepared by updating the preliminary version with the newly assigned physical names. This revised

FIGURE 2
Three Example Code Sheets

	card number		School Name
record name codes →	001	1	Academie Moderne
	002	1	American Training School
	003	1	Boston Museum School
	004	1	Butera School of Art
	005	1	Carnegie Institute

	card number		Number of Addresses	State Location
record name → codes	001	2	35 Commonwealth Avenue, Boston, Mass.	3 1
	002	2	543 Boylston, Boston, Mass.	3 1
	003	2	465 Huntington Avenue, Boston, Mass.	3 1
	004	2	111 Beacon Street, Boston, Mass.	3 1
	005	2	65 Anderson, Boston, Mass.	3 1

	card number		Variables									
record name codes →	001	310c	195408022301021001002003004cccc	3cc2c	134c	18	0103c	2				
	002	310c	195821011102cc1004024c	1ccc	ccc1c	378c	23	020304c	2			
	003	310cc	13022304011c 002c	2ccc	1cccc	4210302c	57	04020103c	c			
	004	310cc	24011370412004035069c	cccc	ccc2c	21cc	11	0602c	4			
	005	310c	194007026029cc1002023057009cccc	2cccc	135c	19	0508223769c	c				

TABLE 4
List of Lists - College File

Logical Names	List Numbers
List 1, Record Names and Numbers	\$L1
List 2, Control of Affiliation: Private or Type of Public	\$L2
List 3, Type of Control or Affiliation	\$L3
List 4, Type of Private Control or Affiliation	\$L4
List 5, Type of Student Body (Sex)	\$L5
List 7, Other Entrance Examination	\$L7
List 8, Other Achievement Tests	\$L8
List 9, Deadline Dates, Application Fee	\$L9
List 10, Kind of Regional or Professional Accreditation	\$L10
List 11, Other Accreditation	\$L11
List 12, Other Undergraduate Divisions of University	\$L12
List 13, Nearest Large City	\$L13
List 14, Transportation to Nearest Large City	\$L14
List 15, Special Interdepartmental Programs	\$L15
List 16, Pre-Professional Training Programs	\$L16
List 17, States	\$L17
List 18, Other Extracurricular Activity	\$L18
List 19, Other Special Programs	\$L19
List 20, Rank in Secondary School Class of Present Freshmen	\$L20
List 21, Grade Average Required at Former Institution	\$L21
.	
.	
.	

form makes it simpler to translate the template for computer execution.

(4) final list of lists (activity 46-29, Figure 1)

With physical names, the list of lists can be finished. The physical names are associated with the list number. See Table 5 as an example.

Summary

In collecting and documenting the data for the construction of a data base, the first task is to define the data. This involves perusing the reference sources to establish a list of variables for which data will be coded. Concomitant with this listing is the task of constructing a template. Specifying the coding format, organizing the lists, coding the data, and preparing additional documentation are other activities that follow.

The data file package of documentation, therefore, includes the following:

1. coding format
2. list of variables with physical names
3. list of lists
4. lists
5. template, rules for template

TABLE 5
List of Lists - College File

LOGICAL NAMES	PHYSICAL NAME	DESCRIPTORS
List 1, Record Names and Numbers	\$L1	BINARY1
List 2, Control or Affiliation: Private or Type of Public	\$L2	CNTRLFNS
List 3, Type of Control or Affiliation	\$L3	TYPFCNTR
List 4, Type of Private Control or Affiliation	\$L4	RLGSFFLT
List 5, Type of Student Body (Sex)	\$L5	SX
List 7, Other Entrance Examinations	\$L7	THRXMQR
List 8, Other Achievement Tests	\$L8	THRCHVMN
List 9, Deadline Dates, Application Fee	\$L9	MNTHFLLP, MNTHSPRN MNTHPPLC, MNTHCCPT MNTHTRNS, MNTHDTCN
List 10, Kind of Regional or Professional Accreditation	\$L10	CCRDNGG
List 11, Other Accreditation	\$L11	THRCCRDT
List 12, Other Undergraduate Divisions of University	\$L12	THRNDGR
List 13, Nearest Large City	\$L13	NMNRSTCT
List 14, Transportation to Nearest Large City	\$L14	TRNSPRTT
List 15, Special Interdepartmental Programs	\$L15	NMFNTRDP
List 16, Pre-Professional Training Programs	\$L16	THRPRPRF
List 17, States	\$L17	STT
List 18, Other Extracurricular Activity	\$L18	THRXTCCR
List 19, Other Special Programs	\$L19	THRSPCLP
List 20, Rank in Secondary School Class of Present Freshmen	\$L20	PRCNTFCL
.		
.		
.		

Section 2

PREPARING A DATA BASE FOR THE COMPUTER

Once the activities described in the previous section are complete, the data are ready to go into the machine. Each document must be translated into language the machine can read.

Procedures for getting the various materials (i.e., scripts, data base level 0 and level 1 records, slide records, and decode lists) loaded onto the disc packs are described in this section. In the first part, the preparation and use of certain control decks and decode lists (or tables) is described. The second part details the use of these decks with various programs in the ISVD Program Load Library in order to write the data records to the disc.

HF Cards. (activity 28-30, Figure 1 of Section 1)

HF cards tell the computer where data is found on the data cards (or on tape) and what type of codes are acceptable. If only numbers should be punched, any letter will be marked as an error. This is an effective method of checking data. Another function of HF cards is to associate the names of the variables with the actual values for each record.

The last function of the HF cards is to reformat or recode data from the cards. Examples of this are removing blanks from large alphabetic fields and handling character binary codes. Specific examples will be given later.

Let us consider the card format in general, then show specifically how each feature is used. First the H card, then the F card will be described.

The H or "header" card is relatively simple. It tells what file name, what subfile name and how many variables there are in the subfile. The format is simple.

col 1	H
col 2 to 3	n = a two digit number telling the number of characters in the file name. Usually 08 in the ISVD

col 4 to (3+n)	File Name
col 4+n to 5+n	m = a two digit number telling the number of characters in the subfile name
col 6+n to 5+n+m	Subfile Name
col 6+n+m to 7+n+m	a two digit number telling which variable is the "name" variable for this subfile (This will be discussed later.)
col 8+n+m to 10+n+m	a three digit number telling how many variables are in the subfile

A typical H card:

H08EDUCATIO06SLIDES02098

F cards or "format" cards are far more complicated in their full glory. However, the simple uses are just as easy.

F cards are a way of describing what variables are in the data base since the information presented is from the coding format listing. Each variable is listed on a separate card. Given is the physical name of the variable, its field length, its location on the code sheets, and other coding specifications. Figure 1 presents some example cards.

An F card has eleven fields of information. Because certain fields may disappear from the format if they have zero width since the field width for some categories is determined by the nature of the data, the F card format is not standardized in terms of coding positions, but in the sequential ordering of the eleven fields. To assist in the interpretation of the examples listed in Figure 1, vertical lines have been drawn to delineate the sections of information.

The first column of an F card is coded with the letter "F" to differentiate it from an H card. This is followed by either the digit "0" or "1". A "0" indicates that there are more cards describing the same variable, "1", that this is the last card describing the variable. The third item of information, the number of letters constituting the physical name (field C), is entered in columns 3 and 4. If the number consists of just one digit, preface it with a zero. Following field C, the physical name of the variable is listed as field D.

Field E is comprised of a block of four spaces for recording the column number in which data are initially recorded for the variable. For the purposes of this documentation, a four digit field is allotted since

column numbers are consecutive for each set of data. For instance, column 1 on card 2 would be column 81, column 1 on card 3, 161, and so forth to 9999. The partially completed F card format below shows that there are 8 letters in the physical name "RCRDNMBR" and that data initially appears in column 1.

A	B	C	D	E
F	1	08	RCRDNMBR	0001

Next, the length of the variable field (field F) is recorded in a three digit field, with the range of possible entries being from 001 to 256. If "RCRDNMBR", for example, was spelled out in a six column field, then the length of the variable field would read "006". If the field will be recorded as binary, field F can be as large as 512.

The number of allowable codes that you wish the computer to recognize is noted in section G, a two digit field. A "00" in section G indicates that any alphabetic input is acceptable.

Field H (2 columns) is concerned with the number of records (translations of the original coding format). If there are none, enter "00". Otherwise the value is the same as field G.

A "01" is coded for field G if any combination of digits is to be recognized. The specifications for field I would read "##" for numbers 00-99, "###", numbers 000-999, and so forth. If you wish to restrict the types of legitimate codes, for instance to three groups, those beginning with the digits "3", "5", and "6", then "03" would be coded in field G for the number of legitimate codes. If the numbers are of a two digit field, section I would read "3#5#6#", if a three digit field, "3##5##6##". For instance, if you are recognizing two legitimate codes, a blank and a number, for a three digit field, field G would be coded "02", and field I would read "###ΔΔΔ".

Field J (2 columns) tells the width of the recode values. It can also be used to specify special kinds of recoding. "00" indicates no recodes. Any other number means the recodes are of specific width. Three other alternatives exist. Field J can be two blanks. This means that some recodes have different lengths. Field J can be "BI". This means the field is character binary. The field can be BL. This means to remove right hand blanks and shorten the field. It is used with alphabetic fields.

Field K further delineates the recode values. If the values for field J (recode width) are 00, BL, or BI, then field K (recode specification) is left blank. If there are real recodes (field K any number but 00), then field K (recode specifications) contains one or more subfields of width specified in field J. The number of subfields is given by field H (number of recodes). Typical uses of recoding would prefix a digit to a field or eliminate a digit. In the example below, the three digit field will be prefixed by a 1. The two digit field preceded by blank will be changed to four columns with 10 in front of the two digits.

Field H J K
 1108RCRDNMBR00130030202####Δ#1041##10##

Finally if field J (width of recode) had value double blank (ΔΔ), then field K has a special format. There are a series of field H (number of recodes) subfields. Each is composed of 3 digits and a variable number of digits specifying the recode.

Field H J K
 1108RCRDNMBR00130030303####ΔΔ#Δ#ΔΔ003####001#002##

This deletes leading blanks from each field.

Most items are very simple to code on F cards. Consider the following typical description of formats.

<u>variable</u>	<u>physical name</u>	<u>card</u>	<u>column</u>	<u>codes</u>	<u>convert?</u>
Record number	RCRDNMBR	1	1-3	000-999	no
Employer & job	MPLYRNDJ	1	5-7	000-999	no
Name of employer	NMFMPLYR	1	10-52	alphabetic	no
City or town	CTYRTWN	1	53-71	alphabetic	no
Street reference	STRTRFR	1	72-73	00-99	no
Summer school	SMMRSCHL	2	25-26	00-99	no
Zip	ZP	1	74-78	00000-99999	no

These are coded as follows. By far the majority of cases fall in these categories.

	A	B	C	D	E	F	G	H	I	J	K
F	1	08	RCRDNMBR	0001	003	01	00	###	00		
F	1	08	MPLYRNDJ	0005	003	01	00	###	00		
F	1	08	NMFMPLYR	0010	043	00	00	BL			
F	1	07	CTYRTWN	0053	019	00	00	BL			
F	1	07	STRTRFR	0072	002	01	00	##	00		
F	1	08	SMMRSCHL	0105	002	02	00	##	00		
F	1	02	ZP	0074	005	02	00	###	00		

Column Identification

- A Card Identifier
- B Card Number
- C Number of Characters in Field Name
- D Field Name
- E Column Data Begins
- F Number of Columns It Occupies
- G Number of Allowable Codes
- H Number of Recodes
- I Specifications of Allowable Codes
- J Length of Recode Values
- K Specifications of Recodes

FIGURE 1

Example F Cards with Column Identification

Certain perverted cases require more difficult recoding and translation.

TRX 4-7 0000-9999 or Δ000-Δ999

A	B	C	D	E	F	G	H	I	J	K
F	1	03	TRX	0004	004	02	00	####	Δ###	00

TV 19-20 01-12

A	B	C	D	E	F	G	H	I	J	
F	1	02	TV	0019	002	04	00	0#10	11 12	00

In the example given above, notice that one of the acceptable values requires exactly the digit zero "0" followed by any digit. The others must match exactly.

YEAR 11-12 00-99 yes 19xx

Here the year is recoded as two digits. To be meaningful, it should have '19' before it.

F	1	04	YEAR	0011	002	01	01	##	04	19##
---	---	----	------	------	-----	----	----	----	----	------

Sometimes several different recodes are appropriate.

Serial number 53-55 100-399 reduce each by 100

F	1	13	SERIAL NUMBER	0053	003	03	03	1##2##3##	03	0##1##2##
---	---	----	---------------	------	-----	----	----	-----------	----	-----------

Admittest 11-33 character binary

F	1	09	ADMITTEST	0011	023	00	00	BI
---	---	----	-----------	------	-----	----	----	----

The card indicates anything is acceptable input. Only "1's" are translated into 1's internally. All other characters are translated as 0's. Notice that it is not necessary to specify any recodes. The next example shows two features: multicard data and variable length recodes.

DAY 10 1-7 as day of week 1 = Mon.

A	B	C	D	E	F	G	H
---	---	---	---	---	---	---	---

F	0	03	DAY	0010	001	07	07	1234567	ΔΔ	006MONDAY007TUESDAY009...006FRIDAY008S
F	1	ATURDAY006SUNDAY								

Card 1 begins with F0; columns 1-80 are used. The second card begins with F1, and column 3 continues right after 80 above. In the last field, there are seven parts (one for each indicated in field H). Each part is a 3 digit number telling the width of the following recode. Then comes the recode.

Additional information about the format of HF cards may be found in Appendix C.

Several overall details about HF cards remain. A data file may have several subfiles within it. The ISVD EDUCATION file contains trade school records, sentence records, slide records, college records, level one records for colleges and level one records for trade schools. Each different kind of record has different variables and different formats. However, one format usually describes many individual records. The set of records described by a single set of HF cards is a subfile. Usually several subfiles of data are processed together and merged into one large file.

In the process of creating the large file, records are numbered according to one of the F cards in its subfile description. The next to last field on the F card points to the correct F card. For subsequent processing, each record of the entire file must have a unique number. However, subfiles are usually sequentially ordered internally. Thus 0001 corresponds to the first college, first trade school and first sentence (as well as other records). Recoding is required to change the numbers and make them unique. To continue with the EDUCATION example, suppose records are numbered as follows on the data cards.

Colleges	001-376
Trade schools	001-128
College slides	0001-0151
College sentences	001-051
Trade school slides	0231-0302

There are several duplicates. However, by prefixing numbers from each subfile differently, we could make the numbers be

Colleges	0001-0376
Trade schools	1001-1128
College slides	2001-2151
College sentences	3001-3051
Trade school slides	4231-4302

A new variable should be created for this purpose. It usually is important to have the original record number available in the processed record.

A second consideration is order of variables within the F deck. While it is convenient to keep the cards in the same order as the documentation, that is often less efficient in use than careful reordering. Those variables referenced most frequently (like record name) should be first. Items requiring lists for decoding should be earlier also. In the current ISVD, there is no detectable difference in response time (between terminal input and system response) between early and late variables. However, on a faster implementation, this probably would be significant.

Finally, the size of the processed records is important. In the current ISVD, there are no continuation records possible for data. Thus only 2048 bytes or characters of data are allowed. You must restrict the size of each record to 2048 or fewer characters. To do so, you must calculate the length of each variable and add.

To determine the length of a variable, look at the F card.

Start with 5.

Add field C (length of name).

If C is even, add 1

If J is BL or 00, add F (with of variable)

If F is odd, add 1

If J is blank (ΔΔ), add longest of the variable length specifier = m

If m is odd, add 1

If J is BI, add 1/8 of F rounding up = m

If m is odd, add 1

If J is a number, add J

If J is odd, add 1

The final result should be an even number. Do this for each variables.

Sum the results and add 4. The final result is the size of the record and must be less than or equal to 2048.

Coding and Keypunching of Lists

Each list needs to be coded for keypunching (activity 5-20, Figure 1 of Section 1) on regular 80 column programming pads. List 101 on page 34 is presented in Figure 2 as an example of a coded list that is ready to be keypunched (activity 20-21). Because the lists interpret the numbers coded on the punched cards, they are also referred to as decode tables.

The first three lines of a decode table identify the list and its specifications. The first line gives the list number. Entered on the second line, the count card, is the number of cards used in the decode table, excluding the ENDR card.

The third line, beginning with "H;" consists of four numbers, each separated by a semicolon. The first number represents the density of table and is coded either "1", "2", or "3". The digit "2" is used if the codes on a list include characters as well as numbers. The digits "1" and "3" apply to codes that are in the form of numbers, with "1" indicating lists where there are few, if any, gaps in the numbering from the lowest integer to the highest, and "3", where there are many unused codes between the lowest and highest integers. The second number on the "H" card, which is "2" in the example decode table, indicates the number of digits in the field, 1 for codes from 0 to 9, 2 for codes from 01 to 99, and so forth. The last two numbers represent the first and last integers coded on the list respectively.

Beginning on the fourth line, the list entries are coded in numerical order. So long as the codes directly follow one another, such as, 07, 08, 09, 10, they may be listed with the same "E" card designation. A new "E" card is entered whenever the codes cease being in consecutive order. For example, there would be a new card for item 12 if the codes numbered 07, 08, 09, 10, 12. There is no limit to the number of characters that may constitute an "E" card, although an individual entry item must not be more than 256 characters. The order of the cards comprising an "E" listing is noted in column 1 through the use of a letter or a number, with each card being listed consecutively. A semicolon separates each of the coded items.

The entries are coded from columns 4 to 72. If a line ends at the end of a word and a space is desired after that word, begin the next line with an "@" followed by a space. Coding is resumed in column 11. Without the "@" to preserve the space, words would run together in the computer printout. For example, "Moving expenses" (item 16 in Figure 3) would read "Movingexpenses" if it were not for the "@".

Following the last item, place an ENDR card, columns 4-7. More detailed decode table specifications may be found in Appendix C.

TABLE 1

Example Decode List

List 101 - Benefits

<u>Code</u>	<u>Meaning</u>
07	Blue Cross - Blue Shield
08	Blue Cross
09	Blue Shield
10	Ross Loos Medical Plan
12	opportunity to participate in curriculum development and research as well as in the supervision of trainees
16	Economy jet fare to St. Thomas for appointee and family. Moving expenses covered.
22	Furnished college housing raises salary equivalent to \$3000
23	helping to design courses and programs in new graduate program
24	hospitalization and medical benefits
99	private school

1	4	9		72	80
			DECODE TABLE;\$L101		
			COUNT;10		
			H;3;2;07;99		
			B;07;BLUE CROSS - BLUE SHIELD;BLUE CROSS;BLUE SHIELD;ROSS LOOS MEDICA		
A			L PLAN.		
			B;12;OPPORTUNITY TO PARTICIPATE IN CURRICULUM DEVELOPMENT AND RESEAR		
A			H AS WELL AS IN THE SUPERVISION OF TRAINEES.		
			B;16;ECONOMY JET FARE TO ST. THOMAS FOR APPOINTEE AND FAMILY. MOVING		
A			@ EXPENSES COVERED.		
			B;22;FURNISHED COLLEGE HOUSING RAISES SALARY EQUIVALENT TO \$3000;HELP		
A			ING TO DESIGN COURSES AND PROGRAMS IN NEW GRADUATE PROGRAM:HOSPI		
B			TALIZATION AND MEDICAL BENEFITS		
			B;99;PRIVATE SCHOOL		
			ENDR		

FIGURE 2

A Decode Table Ready to be Keypunched

Coding for decode tables follow the CRD Scan format described in Appendix C. This format allows considerable flexibility in revising errors. It may be helpful to point out that it is not necessary to use all columns 4-72. It is not necessary to use only sequential letters in the continuation column 1. You may use any symbol not lower than the previous symbol.

Suppose you made an error, leaving out a letter on a card:

```

      ↓
F      HOW ABOUT;BLUE SHIELD;BLUE CROSS-LU
G      E SHIELD;RED CROSS-YELLOW SHIELD
  
```

Ordinarily you might have to repunch the entire card, but not with the CRD format. Duplicate card F up to the error. Start a new card F with the correction, and insert the pair.

```

F      HOW ABOUT;BLUE SHIELD;BLUE CROSS-
F      BLU
G      E SHIELD;RED CROSS-YELLOW SHIELD
  
```

All the lists for an entire file are coded and punched. The entire set is placed in one stack. Prefix the full stack by a file card and end it with an end of file card (i.e., a "%" in column 1).

col. 4

↓

FI;"filename"

DECODE TABLE;\$L1

COUNT;25

H;2;3;100;125

E;100;A;B;C

E;121;X;Y;Z

ENDR

DECODE TABLE;\$L2

COUNT;10

H;1;1;1;2

E;1;YES;NO

ENDR

} repeat as needed

%

This set of cards comprises all the lists. You must also prepare another special decode table called \$LØ. This decodes the numbers of each new record name. There must be an entry for every record in the file. Numbers are those assigned by the HF deck.

DS Cards

The computer, like a person, needs to know which of the lists corresponds to each variable. For people, the list of lists provides the information; for the computer, a deck of DS cards contains the information. The program DSCLOA processes the DS cards.

DS cards are written in CRD format (activity 29-32, Figure 1 of Section 1), that is with semi-colons as separators between arguments. For each variable that is decoded, make one card with the following entries.

field 1	DS	indicates a DS card
field 2	2 or 1	indicates decoding type described below
field 3	Ø	
field 4	Ø	
field 5	'name'	physical name of variable - 1-17 characters
field 6	'list'	name of list, must be in form \$L'number' where 'number' is a one or two digit integer

Typical cards look like this:

col. 4

↓

DS;2;Ø;Ø;CTY;\$L3

DS;2;Ø;Ø;MNFR;\$L21

DS;1;Ø;Ø;NMBR;\$L54

Field two tells whether the decoding should be as binary flags (1) or as characters (2). If the values in the table are literally found in the data, use (2). If they are found by counting bits or positions in a field, use (1).

In the full implementation of the ISVD, fields 2, 3, and 4 will be more complex. For a complete description of FMTBL and entries 3 and 4, see Appendix C, HASM TABLES. The FMTBL discussed in that memo was not implemented by the ISVD.

The DSTBL created from DS cards can be more than one record 2048 characters in length. If it is, it is split into two or more records. This takes more time internally, so it might be useful to describe the method for computing the size of the table.

For each card

Start with 13

Add the number of characters in 'name' = n

If n is even, add 1

(The final total for a card is even.)

Sum the numbers for each card.

Add 54.

If the result exceeds 2048, you will create two or more records.

Preparation of DASM-10 Control Cards

After a disc pack has been initialized by BTSS (see below, next section), it must be prepared for files to be written to it. The DASM-10 program causes this preparation.

A. Pack Definition

The following cards constitute a DASM-10 deck:

1 2 3.....10 11	12.....24	25 26-28 29-31 etc.
<u>card 1</u> : P Δ Packname	Δ BTSS HAS CABS	Δ n ₁₃ n ₂₃ etc.

- The Packname is any 8-character name to identify the disc pack. (When using DSCLOA, see below, the media name used on the FI; card must be identical with the packname used here.)
- In RCA's BTSS, certain cabinets on each disc are reserved for BTSS use. While the listing of these cabinets in the P control-card is optional, it proves useful in determining the space on a disc available for files. A disc pack is organized into cabinets, cylinders, and tracks. A track consists of 3600 bytes, of which 2048 (one half-page) are used by the system described here. There are 10 tracks in a cylinder and 8 cylinders in a cabinet. There are 203 cylinders to a pack, and consequently 2030 tracks and 26 cabinets (of which the first has only 3 cylinders). Cylinders are numbered 000 through 202, going from the outer edge of the

disc to the center. Cabinets are numbered 00 through 25, in the same manner. Cabinet 00, then, is made up of cylinders 000, 001, and 002. Cabinet 01 begins with cylinder 003. The need for this detail will become apparent. BTSS reserves for itself Cabinet 00 on all discs.

1. On the primary disc, it reserves the following:
 - a. Cabinet 01
 - b. Six additional cabinets, chosen so that they are (1) contiguous and (2) centered around cabinets 12, 13, or 14. The central cabinet will be determined according to the number of bad tracks encountered. The DASM-10 user is advised to anticipate that BTSS cabinets might begin with 09 or extend to include 17.
 - c. The modified BTSS (MBTS), used in this system, also reserves a cabinet for each user code (i.e., the system name for each terminal), beginning with cabinet 02.

A typical P-card for a primary disc might look as follows:

PAPACK1202ΔBTSSΔHASΔCABSΔ01,02,03,04,09,10,11,12,13,14,15,16,17

This would indicate that three user codes were available in the system.

2. On the secondary discs taken as a set, BTSS reserves a total of eight cabinets, distributed as uniformly as possible among the discs and subject on each disc to restrictions of contiguity and centering around 12, 13, or 14. In the case of three secondaries, for example, three each are reserved on the first two and two on the last.

Further details of disc organization in BTSS can be found in BTSS Specifications for Time Sharing Disc Allocator (SYSCRIBE).

B. Sub-media Definition

Those cabinets which are not reserved for BTSS can be used for ISVD-type files. Any set of empty contiguous cabinets is referred to as a sub-media. Sub-media definition is done on the control cards immediately after the P-card, one card for each sub-media.

Card 2 (3,etc.)

1 3.....10 12....19 21 - 23 25 - 27 29

SΔSub-media NameΔPacknameΔ1st cyl. no.Δlast cyl. no.Δ"U"

Sub-media name is any 8-character string, uniquely used to identify the range of cylinders between 1st cylinder number and last cylinder number.

The first cylinder number can be derived using the organization of a disc pack given above on pp. 38-39. Remember that cabinet 01 begins with cylinder 003.

C. File Definition

Following the Sub-media definition cards are cards to define all the files for the disc-pack. There must be one card for each file of the following form:

1 3.....10 12.....19 21.....24 26 28-29

FΔFilenameΔSubmedianameΔownersnameΔUΔ00

1. The filename is that 8-character string by which the file will be referenced in the system. The current version of the system software makes it impossible to use any filenames not on the following list:

SCRIPTSA	NICKNAME	HGSEΔPLA
SCRIPTSB	INQTABLE	NEWTONΔP
OCCUPATI	HASMFILE	
EDUCATIO	MILITARY	

These names are used by the modules HASM and GLURP and addition of new file names would require changes in the coding of those two programs. Furthermore, there must be a file named HASMFILE defined by DASM-10 (the HASM module will call for it as part of its initialization procedure). Insofar as a script system is created for use, the scripts must be sorted into two files. SCRIPTSA will contain all scripts the first letter of whose name begins with A - L; those starting with M - Z go into SCRIPTSB. Any scripts not stored in this manner will not be found by the operating system.

2. Files must be located in a particular sub-media. It is not possible to have one file stored in more than one sub-media. A critical issue, then, concerns the size of each sub-media available for use and the size of the files it is desired to have on the disc. On the S-cards (see above) the first and last cylinders of each sub-media are specified. Thus, a typical sub-media on a secondary disc might extend from cylinder 003 through cylinder 066. Recalling that there are 10 tracks per cylinder, this means that that sub-media has 640 available tracks.

At this point, one must consider the so-called loading factor. It has been found that if more than 80% of the tracks in a sub-media are loaded with file records, serious impairment in response-time occurs. Because response-time is affected by other factors as well, it is suggested that a 60% to 70% loading factor be observed. In particular, script files should aim for the lower limit recommended because script revisions and additions are likely to occur (and thereby increase the loading factor beyond the originally planned value).

To compute the size of the files to be written to disc, use the following rules of thumb in determining the number of records of each type that will be packed in a disc track:

Level 0 Records	One record per track
Sentence Records	Seven records per track
Level 1 Records	Thirteen records per track
Decode Tables	One record per track
Scripts	One*record per track

By adding all of the records in a sub-file (each of the record-types listed can be considered a sub-file), dividing by the number of records/track, and then dividing again by the desired loading factor, one can compute the number of tracks required for the storage of that data.

For example, consider the following file:

<u>Sub-file</u>	<u>No. Records</u>	<u>Recs/track</u>	<u>Loading Factor</u>	<u>Tracks Required</u>
Level 0	600	1	.70	857
Level 1	50	13	.70	6
Sentence	20	7	.70	4
Decode Tables	50	1	.70	71
Total Tracks Required for File				938

Therefore, to load this file there must be a sub-media available of at least 938 tracks, or 94 cylinders.

One highly significant difference between a system that can use four disc drives (a primary and three secondaries) and one that has only two (a primary and one secondary) is the maximum sub-media size available.

* In the case of scripts, each script is generally more than a single record. The output from the CTSL program will tell you exactly how many records constitute each script. See details of this in the next section.

Because BTSS reserves eight cabinets on the secondary discs, a four-disc system, with only two or three BTSS cabinets in the middle of the disc, can have sub-media in the 85 to 100 cylinder range. In a two-disc system, with all eight BTSS cabinets on the single secondary disc, the maximum sub-media size is around 66 or 67 cylinders. It is therefore important to consider the available hardware before planning construction of data files.

3. Owner's Nickname. Each file is considered to have an owner, who, in a more finished version of the system, would have certain access rights to that file. In the present version, it is sufficient to assign any owner name to a file. It would be a good idea, however, to create a file for each owner name used. This raises the question of what the system expects to find with respect to users of the system. A very brief summary follows.

In Logging-in the first (and all subsequent) user, the system will execute a script called LOGIN which among other things will request an identification number from the user. This number is then treated as the name of a record in a file called NICKNAME. Therefore, there must be a NICKNAME file on the disc, having as its various record names all of the anticipated user I.D. numbers. Within each record there must be three descriptors, as follows:

PASSWORD	contains the password for that user
NICKNAME	contains the name of the file for that user
IDENT	contains the I.D. number (same as the record name)

Each user must have a file defined for him in the DASM-10 routine. Format for these filenames is any four letters plus the literal FILE. Thus, BOBYFILE or ANNEFILE. The name of this file must be the contents of the descriptor NICKNAME in the record whose name is that user's I.D. number in the NICKNAME file. In the present version of ISVD, all systems files (such as scripts and data bases) were given owner's name based on the first four letters of certain dummy user files. Thus, SCRIPTSA was owned by DBM2, referring to DBM2FILE.

A set of DASM-10 cards for a four-disc system might look something as follows:

Primary Disc	P	PACK0313	BTSS HAS CABS 01,02,03,04,05,06,07,08,09, 10,11,12,13,14,15,16		
	S	SMHI0313	PACK0313 131 200 U		
	F	INQTABLE	SMHI0313 DBM3 U 00	} some user files	
	F	DBM1FILE	SMHI0313 DBM1 U 00		
	F	DBM2FILE	SMHI0313 DBM2 U 00		
	F	DBM3FILE	SMHI0313 DBM3 U 00		
	F	BOSSFILE	SMHI0313 BOSS U 00		
	E R	<-----required last card for DASM-10 run			
	1 st Secondary	P	PACK1313	BTSS HAS CABS 11,12,13	
		S	SML01313	PACK1313 003 082 U	
S		SMHI1313	PACK1313 107 200 U		
F		SCRIPTSA	SML01313 DBM2 U 00		
F		OCCUPATI	SMHI1313 DBM3 U 00		
E R					
2 nd Secondary	P	PACK2313	BTSS HAS CABS 11,12,13		
	S	SML02313	PACK2313 003 082 U		
	S	SMHI2313	PACK2313 107 200 U		
	F	SCRIPTSB	SML02313 DBM2 U 00		
	F	EDUCATIO	SMHI2313 DBM3 U 00		
	E R				
	P	PACK3313	BTSS HAS CABS 11,12		
	S	SML03313	PACK3313 003 082 U		
	S	SMHI3313	PACK3313 099 200 U		
	F	NICKNAME	SML03313 DBM1 U 00		
	F	MILITARY	SMHI3313 DBM3 U 00		
	E R				

A set of DASM-10 cards for the secondary disc of a two-disc system might look like this:

```

P PACK1313 BTSS HAS CABS 09,10,11,12,13,14,15,16
S SML01313 PACK1313 003 066 U
S SMHI1313 PACK1313 131 200 U
F NICKNAME SML01313 DBM1 U 00
F SCRIPTSA SML01313 DBM2 U 00
F SCRIPTSB SML01313 DBM2 U 00
F OCCUPATI SMHI1313 DBM3 U 00
E R

```

D. What Can Go Wrong?

The most likely error occurs on the S-cards, by assigning first and/or last cylinders to a sub-media which overlap BTSS cabinets. Either your arithmetic was faulty or BTSS took a cabinet you hadn't anticipated (generally because of bad tracks on the disc). Recalculate and try again until it works. If the E R card is omitted, the run will not succeed and the disc must be initialized by BTSS again as well as by DASM-10.

Setting Up the Data-Base Programs

Given all the data and appropriate cards, you still must create the disc pack containing the data base. This requires a number of steps and much processing. Several programs are involved. Collectively they are the three JNK programs and DSCLOA. The diagram in Figure 3 (page 45) indicates the input and output of each program. These are described in detail below.

Four separate trees of activities combine to create an on-line operating data base. One readies a disc pack to accept the data. The second places the raw data on the disc. A third places the decode tables onto the disc. The fourth puts scripts onto a disc. Let us consider each in turn.

Tree 1 - Disc Initialization

Disc initialization requires two phases; first the RCA basic time sharing (BTSS) initializes the discs allocating space for its swapping cylinders. This is a standard run under the TSIM system. For details, see "Computer Operators Guide to ISVD Programs" by Hutchinson, Kaiser, and Madoff (see Appendix D).

DASM-10 specifies the initialization for each data base. The only input is a set of DASM-10 cards which were described earlier. Nearly the only possible error is trying to initialize a pack twice for the same file or sub-media.

Tree 2 - Raw Data

The second tree concerns the raw data. Many steps are included. We will discuss them in turn. First the raw data are placed as card images onto tape. These should be unblocked records of fixed length. Each item may require one or more records on the tape. Multiple cards will require multiple records. Each subfile should be separated by a single tape mark. A complete tape might look like Figure 4 (page 46).

Standard packaged programs write cards to tape. In the RCA TDOS, the program is called CARD TO TAPE (CDTP). Sometimes it is difficult to get a single tape mark between files. If you have more than one, you can modify the HF deck to accommodate the problem. Simply insert a one card

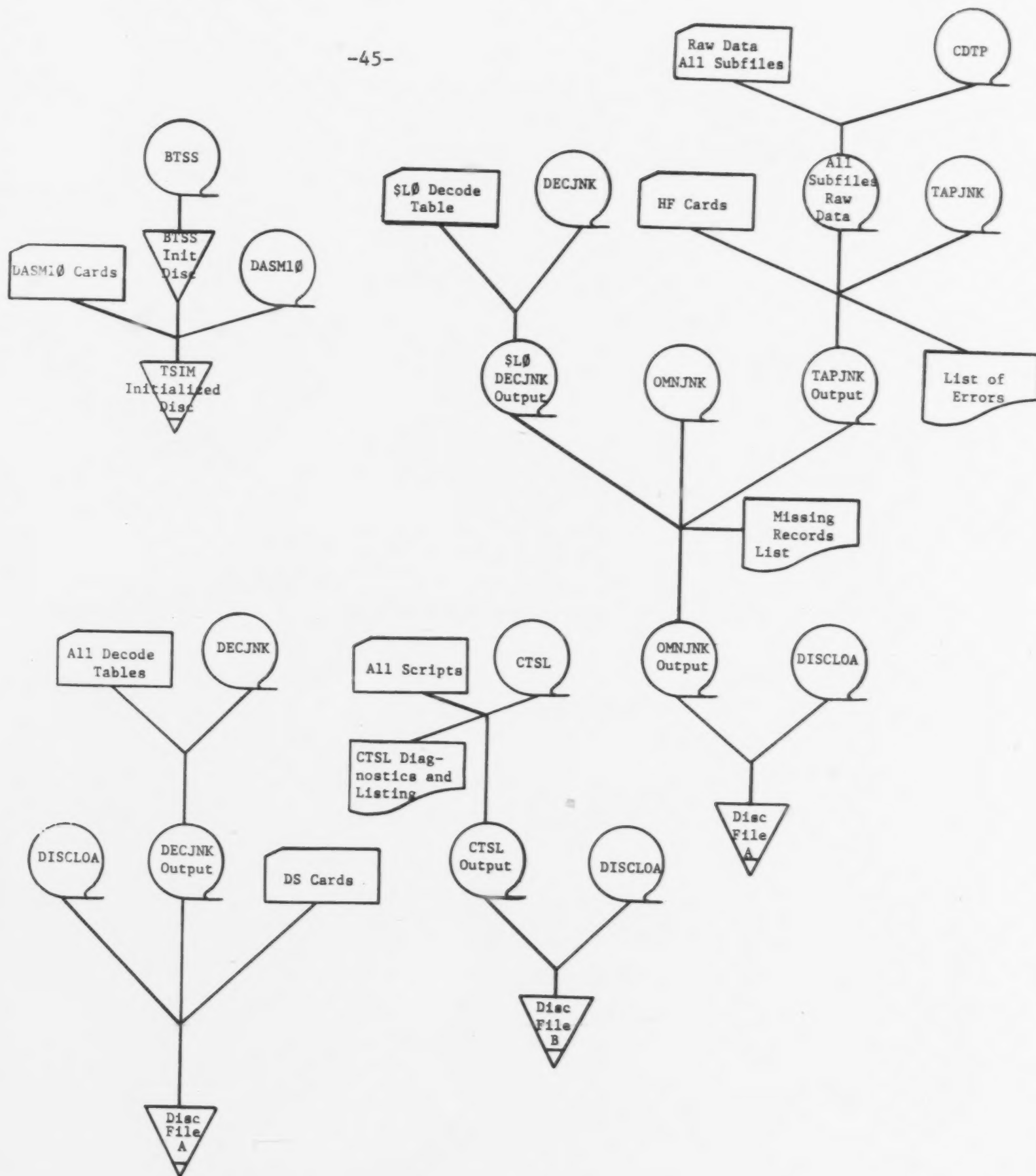


FIGURE 3

Computer Processing for the ISVD Data Files

subfile 1

item 1 record 1
item 1 record 2
item 2 record 1
item 2 record 2

.

.

.

TAPEMARK

subfile 2

item 1 record 1
item 2 record 1
item 3 record 1

.

.

.

TAPEMARK

subfile 3

item 1 record 1
item 1 record 2
item 1 record 3
item 1 record 4

item record 1
item record 2
item record 3
item record 4

.

.

.

TAPEMARK

end of file

FIGURE 4

Typical Raw Data Tape

"fake" deck for each tape mark after the first. Such a deck might have two cards:

```
H08TESTFILE04FAKE01001
F101A000010010000000
```

The next step is to prepare the \$L0 decode table. This table is the same as other decode tables, but is never placed on the disc. Instead it is used to provide unique names for data records. Every record has a number. That number corresponds to an entry in the \$L0 table. To create the table, use the \$L0 cards and the DECJNK program.

A number of errors can cause problems in this program. Most are incorrectly set up. The correct set up is given below:

```
col. 1  col. 4
  ↓    ↓
Run time parameters
  FI;filename          } <-----column 4 begins
  DECODETABLE;$L0
  COUNT;10
  H;2;4;1000;4009
  E;1003;
  A                    } There may be other groups of E cards.
  B                    } See Appendix C.
  C
  ENDR
%                      } <-----column 1 begins
/*
```

Possible errors:

Program stops before end of deck

<u>Last Card Read:</u>	<u>Possible Cause:</u>
(1) COUNT	(1) no number or letter in place of numbers
(2) H	(2) width wrong or letters instead of numbers
(3) first E card	(3) count or H card missing
(4) any E card	(4a) entry has letters instead of numbers
	(4b) entry smaller than last computed
(5) continuation card	(5) no continuation code
(6) improper termination	(6) missing % card
(7) program terminates, but output proves unusable by OMNJNK or DISCLOA	(7) FI card missing

You can determine which records are included in the final data base by changing the \$LØ table. Any item that is not in \$LØ can be eliminated from the data base when running OMNJNK. This feature is often useful to decrease the size of a data base or to select only items that have been revised.

In parallel, the raw data tape is processed to produce TAPJNK output and a listing of errors. Input includes the HF deck. TAPJNK provides few error diagnostics; it usually bombs inelegantly. Fixing the problem may be difficult. Possible problems are listed below.

<u>Problem</u>	<u>Possible Cause</u>
(1) Program stops in middle of the HF deck.	(1a) Count of F cards on the H card was inaccurate. (1b) The letter O appears in place of number Ø. (1c) Acceptable entries are incorrect - too many (or few) characters. (1d) Length of field incorrect (1e) Length of recode incorrect (1f) Program hates you.
(2) Program runs fine, but gives thousands of error messages.	(2a) Extra card on the raw data tape (2b) Missing card on raw data tape (2c) F card for Descriptor specifies wrong column.
(3) 3A4 IS UNACCEPTABLE INPUT FOR DESCRIPTOR CTY IN RECORD 216	(3a) Coders surprised you by introducing their own system. (3b) No descriptor is taken from last card.

Usually the errors fall in clumps. One way to be very sure the cards are all on tape is to introduce some fake descriptors that simply look at the card number. Any error in those descriptors point directly at the offending spot. If every descriptor has errors, you probably have card problems. If one descriptor has lots of errors, it is specified incorrectly.

It should be mentioned that unacceptable descriptors are written to the tape just as they are picked up. The output is logically compatible with further processing. When you get down to a tolerably small set of errors, you can just use that tape.

In spite of every precaution and multitudes of proofreading and key verifying every HF deck, we always had five to ten errors. F cards have a disagreeable and inhuman format, so this is to be expected. Let the TAPJNK program find the errors. The emotional and clerical strain saved is worth the dollar cost of running this fast program.

The next program is OMNJNK which combines \$LØ and TAPJNK output onto a single tape. The program runs rapidly, but gives no indication of errors. Several can occur:

<u>Problem</u>	<u>Possible Cause</u>
(1) No records are found (messages on printer).	(1) No FI card in DECJNK run
(2) Program bombs.	(2) Too large \$LØ. Current limit is COUNT;3ØØ.
(3) No output tape	(3) I have no ideal
(4) Too many missing records	(4) Something wrong with \$LØ cards

The final stage of raw data processing involves getting the records onto the disc pack. This is done using the DCSLOA program. Required parameter card input is discussed below under decode tables.

One contingency requires elaboration in the DSCLOA run with records output from the OMNJNK program. Because the DS card deck (for the DSTBL) is generally loaded with the decode tables (output from DECJNK -- see discussion of Tree 3, below), it may or may not be loaded with this run. If it is not, however, DSCLOA will construct a dummy DSTBL anyway, and put the dummy on disc in the place of the real DSTBL (which, with decode tables, should be loaded before the OMNJNK output records). There are two ways to deal with this. The simplest is to load the DS cards a second time -- the DSTBL created will be identical with the one already on the disc and will therefore replace it. The second procedure is to place the INSEG (scratch tape) drive on local at some point after the TABLES ARE WRITTEN TO TAPE console message, but prior to assigning the disc pack for writing records to disc. Since the DSTBL is written from INSEG to disc after the other records, those will be written properly and the program will halt with a DEVICE INOPERABLE message. Even though there is no way to end the program with a normal halt without putting the tape drive on remote, the desired records are properly written to disc.

Tree 3 - Decode Tables

The third activity tree concerns decode tables. Here again the run set up is for DECJNK. Multiple tables can be run at the same time. Several new problems can arise:

Count card value too small

Missing ENDR card.

Once the DECJNK output tape is prepared, it must be written to the disc pack. This is done through DSCLOA. The DS cards are also processed simultaneously to create a DSTBL. The parameter cards for a DSCLOA run are as follows:

```
col. 1  col. 4
  ↓    ↓
Run time parameters
FI;filename;media name
$ TABLES;$filename TBL
COUNT;30
FL;1
{ DS deck
  ENDR
%
/*
```

All cards from the FI card through ENDR are punched in CRD scan format. In effect, this means that the first field starts in column 4.

'Filename' is the same as the filename on each input deck and each H card. The disc must be initialized for 'filename'; 'media name' must match the media initialized on the disc by DASML0 (in the DASML0 writeup, this is referred to as the Packname).

Possible problems with DS cards include:

- (1) Filename or media name not initialized on pack.
- (2) Count value too small (30 is large enough for a single record -- for more, add 30 each record). See discussion of DSTBL length computation on page 38.
- (3) Not enough arguments on a DS card.
- (4) Too many arguments on a DS card.
- (5) Arguments starting before column 4.
- (6) No ENDR card.
- (7) No % card.

(8) Filename does not match that on input tape or input deck.

Tree 4 - Scripts

The fourth and last part of preparing a data base for action is to get the associated scripts to the disc. The program used is CTSL (card to tape script loader). This program will work on other data as well as scripts. Here we will consider scripts as a particular case.

Script decks are punched in CRD format. The script is called a record and each step is a descriptor. Appendix C includes a memo describing the keypunching of scripts. Basically the format is as follows for each script.

```
col. 4
      ↓
      RECORD;scriptname
      COUNT;cnt;                or COUNT;cnt;n
      D;stepno1;CRT....
      D;stepno2;.....
      .
      .
      .
      ENDR
```

Scriptname is any set of characters, not beginning with '\$'. The length is 1 to 30 characters. No spaces may appear.

cnt Some number, usually equal to the number of cards in the script.
n n is understood to be 6 if omitted; if included, it should be less than 6. n controls the size of entries in the table of contents. Usually it can be as small as 3 without much loss of efficiency.
n must be less than 6 if the number of records in the script exceeds 23. The table of values is as follows:

<u>number of continue records</u>	<u>n</u>
0-19	6
20-23	5
24-29	4
30-39	3
40-59	2
60-119	1

The number of continue records is related to the 'cnt' value. Our experience has shown that you can compute the number of continue records approximately as follows:

Let C be the number of cards in the script deck.

$$\text{Records} = \frac{3/4 C}{28}$$

CTSL is helpful in these calculations. The last line of output tells the acceptable values for count card. On subsequent runs you can adjust the count if desirable.

The entire set up for CTSL is as follows:

```
col. 1  col. 4
  ↓    ↓
run time parameters
  FI;SCRIPTSA;reelname
  $ TABLES;$SCRIPTSA TBL
  COUNT;25
  FL;1
  ENDR
  {RECORD;scriptname}      one or more scripts
%
/*
```

Reelname is an 8 character name for the output tape. Usually it contains the date of processing.

There can be more files in a single run. The control cards except for run time parameters are prepared for other files and included in line between % and /*. For each new file, a new tape must be mounted. Other files will use names other than SCRIPTSA in the FI and \$ TABLES card.

CTSL provides plentiful diagnostic aids for problems in scripts and other data. Diagnostics preceded by ### are fatal and can occur in all data. Most are self explanatory, but one is confusing when first encountered.

Script processing terminates after one record, the root record. The message is

"### can not output rest of record."

The problem is usually the COUNT card missing one or more arguments.

Another common problem is a missing ENDR card between scripts. This causes 2 scripts to fail, that before and after the ENDR card.

Diagnostics preceded by \$\$ are specific to scripts and to the formats allowed in GLURP in the ISVD. The messages are as follows:

\$\$ EXTRA RIGHT PARENTHESIS IN STATEMENT

This can mean a missing left parenthesis as well.

\$\$ EXTRA LEFT PARENTHESIS IN STATEMENT

\$\$ STEP LENGTH INAPPROPRIATE

\$\$ SCRIPT STEP OUT OF ORDER OR EQUAL TO THE LAST

\$\$ XXXX CRT CHARACTERS BETWEEN KEYBOARDS

The limit is 768. Most errors of this type are caught.
XXXX is replaced by the number of characters.

\$\$ ERROR IN STEP FORMAT

Usually colons or spaces or periods in error.

CTSL output, like all others, is placed on the disc by DSCLOA. See writeup in DECODE TABLE section.

Section 3

THE PREFERENCE SCRIPT

Developing the scripts to interface the data with the inquirer is the third operation involved in the preparation of a data base. The most important of these access scripts is the preference script. It enables a list of possibly suitable schools or job titles to be sorted for the inquirer on the basis of his personal preferences and characteristics. The techniques involved in writing such a script can be categorized into three areas of activity, to be explained subsequently:

- (1) establishing the questions
- (2) structuring the script organization
- (3) specifying the documentation

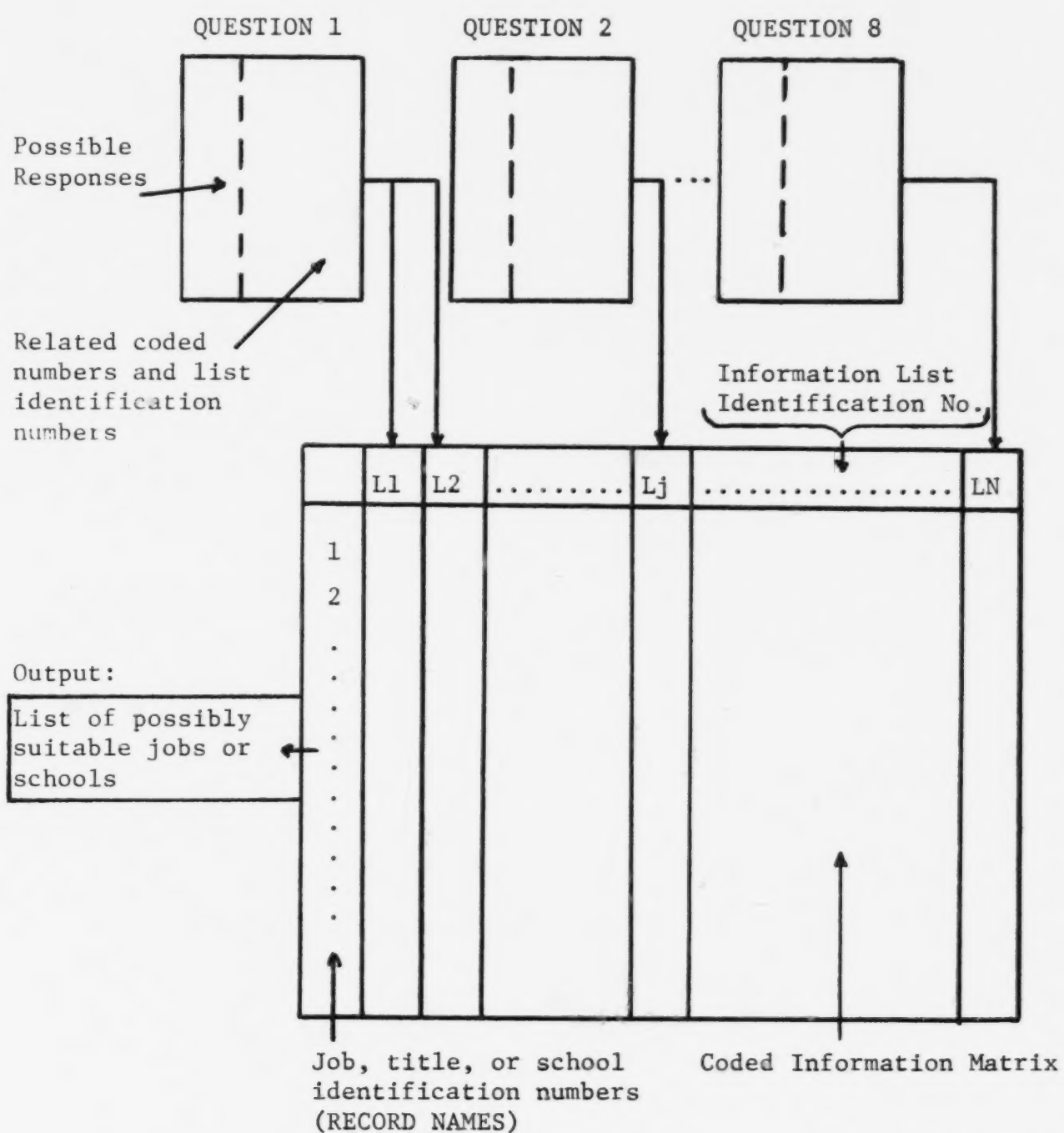
In the ISVD system, there are preference scripts for the Occupation, Education (college and trade school), and Military Data Bases. The Occupational Preference Script is the model for the preference scripts in the ISVD system since more thought was given to its conceptualization, documentation, and implementation than to other scripts.

Establishing the Questions

The nature of the coded information, the degree of specificity desired for a script, the field situation in which the system is to function, and the characteristics of the test sample are some of the factors that will determine the kinds of questions comprising a specific preference script. Shown in Figure 1 is a diagram of how an inquirer's traits and preferences may be converted to a list of possibly suitable jobs or schools. Illustrated in Example 1 is an interaction with the Occupational Preference Script.

In establishing the questions for a preference script, first determine the relevant topic headings by scanning the data base list of variables. Then categorize the appropriate variables under each of these major listings. Because of the nature of the coded data, some variables may be applicably subsumed under several headings. Often a classification of this nature occurs in conjunction with the preliminary structuring of

SCRIPT PRESENTS QUESTIONS TO INQUIRER:



Arrows indicate sequence of activities.

Figure 1

Schematic Diagram for Converting Inquirer's Traits and Preferences to Possibly Suitable Jobs or Schools

Example 1

Interaction with the Occupational Preference Script

SYSTEM: THERE ARE SURELY SOME TYPES OF ACTIVITY YOU PREFER OVER OTHERS. HERE ARE FIVE PAIRS OF ALTERNATIVES. THE CHOICES YOU MAKE HERE WILL BE USED TO HELP SELECT JOBS FOR YOU TO CONSIDER LATER. MAKE AS MANY OR AS FEW CHOICES AS YOU LIKE, BUT NOT BOTH ALTERNATIVES OF A PAIR. IF YOU HAVE NO PREFERENCES, SIMPLY PUSH "SEND BLOCK".

- A1 WORKING WITH OBJECTS OR THINGS, OR
- A2 WORKING WITH PEOPLE AND COMMUNICATING IDEAS.
- B1 DOING BUSINESS WORK, OR
- B2 DOING SCIENTIFIC AND TECHNICAL WORK.
- C1 ROUTINE, ORGANIZED WORK, OR
- C2 UNSTRUCTURED, CREATIVE WORK.
- D1 WORKING IN SOCIAL SITUATIONS, OR
- D2 WORKING WITH MACHINES AND PROCESSES.
- E1 GETTING PRAISE OR PRESTIGE FROM OTHERS, OR
- E2 WORKING FOR YOUR OWN SATISFACTION.

INQUIRER: B1

SYSTEM: THINK CAREFULLY ABOUT YOURSELF AGAIN, AND DECIDE IN WHICH OF THE LISTED AREAS YOU ARE STRONGER, WEAKER OR AVERAGE IN RELATION TO MOST OF YOUR CLASSMATES. YOU KNOW, OF COURSE, THAT YOU CAN COME BACK LATER AND CHANGE YOUR SELECTION IF YOU CHANGE YOUR MIND. INDICATE AS MANY OR FEW AS YOU WISH, WITHOUT CONTRADICTING YOURSELF. THERE ARE NOW 148 JOBS LEFT.

- G1 I THINK I AM HIGH IN GENERAL INTELLIGENCE
- G2 LOW
- G3 AVERAGE
- V1 I AM VERY GOOD AT USING WORDS AND LANGUAGE
- V2 NOT GOOD
- V3 AVERAGE

SYSTEM: N1 I AM VERY GOOD IN MATH
N2 NOT AT ALL GOOD
N3 AVERAGE

INQUIRER: G3 V3

SYSTEM: NOW LOOK AT THREE MORE AREAS AND TYPE THE APPROPRIATE NUMBERS.
THERE ARE NOW 64 JOBS LEFT.
[INQUIRER IS ASKED TO RATE HIMSELF ON VISUAL PERCEPTION, CLERICAL ABILITY, AND MANUAL DEXTERITY.]

INQUIRER: P3 C3 M2

SYSTEM: ...DO YOU FEEL THAT ANY OF THE FOLLOWING WILL AFFECT YOUR CHOICE OF EMPLOYMENT? IF SO, TYPE THE NUMBERS AND THOSE TOPICS WILL BE DISCUSSED HERE FURTHER. ASK FOR AS MANY OR FEW AS YOU LIKE. THERE ARE NOW 11 JOBS LEFT.

1. I AM CONCERNED WITH THE PHYSICAL DEMANDS OF THE JOB.
2. I AM INTERESTED IN THE WORKING CONDITIONS IT WOULD HAVE.
3. I FEEL MY EDUCATION WOULD AFFECT MY CHOICE OF JOBS.
4. I FEEL SALARY AND INCOME ARE IMPORTANT.
5. I WOULD WANT TO KNOW ABOUT OPPORTUNITIES FOR SECURITY OR ADVANCEMENT.

INQUIRER: 4

SYSTEM: ...FIRST, PLEASE INDICATE WHICH SALARY LEVEL YOU WOULD BE SATISFIED WITH EVENTUALLY.

1. YOU WOULD BE SATISFIED BY RELATIVELY LOW INCOME (LESS THAN \$7,500 YEARLY, WHICH IS LESS THAN \$150 WEEKLY OR \$3.75 HOURLY.)
2. YOU WOULD BE SATISFIED WITH EVENTUALLY AT LEAST MIDDLE INCOME, THAT IS, UP TO \$15,000 YEARLY OR \$300 WEEKLY.
3. YOU WANT TO HAVE A GOOD CHANCE OF HIGHER INCOME, THAT IS, OVER \$15,000 YEARLY.

INQUIRER: 1

SYSTEM: THERE ARE 11 JOBS ON THE LIST. HERE ARE THE JOBS SELECTED BY YOUR RESPONSES IN THIS INTERVIEW. IF YOU WOULD LIKE A

SYSTEM: COPY OF THIS, PUSH THE HARD COPY BUTTON.

0032 MANUFACTURERS REPRESENTATIVE

0041 INFORMAL WAITER

0282 AIRPLANE DISPATCH CLERK

0298 HOUSEKEEPER

0356 MUSIC LIBRARIAN

0532 AUTOMOBILE SALESMAN

0543 UPHOLSTERY REPAIR SALESMAN

0560 DETECTIVE

0738 TILE SHADER

0767 BRIDAL CONSULTANT

NOW WOULD YOU LIKE TO

1. LEARN MORE ABOUT SPECIFIC JOBS ON THE LIST,
2. DO THE INTERVIEW OVER TO GET A DIFFERENT LIST, OR
3. GO ON TO SOMETHING ELSE,
4. SEE MORE JOBS ON THE LIST

INQUIRER: 1 LEARN MORE ABOUT SPECIFIC JOBS

Table 1

Variables - Military Data Base

Navy General Descriptions
Availability for Women
Chart Number for Navy List
*Places of Work
*High School Courses
*Prior Experience
*Abilities, Aptitudes, Traits - Navy, Air Force
*Areas of Study - Navy
Navy Specialties
Service Schools - Navy
*Related Civilian Jobs - Navy
Related Navy Jobs
*Knowledge and Skills Gained - Air Force
Specialized Air Force Jobs
*Related Civilian Jobs - Air Force
Air Force General Descriptions
Army General Descriptions
*Related Civilian Jobs - Army
*Mental Requirements - Army
*Physical Requirements - Army
*Knowledge and Skills Gained - Army
Specialized Army Jobs
Personnel Requirements - Army

*relevant variables for preference script

Table 2

Classification of Variables for Military Preference Script

1. Work Location
2. High School Courses
3. Work Experience
 - a. Prior Experience
 - b. Related Civilian Jobs - Navy
 - c. Related Civilian Jobs - Air Force
 - d. Related Civilian Jobs - Army
4. Physical Attributes
 - a. Abilities, Aptitudes, Traits - Navy, Air Force
 - b. Mental Requirements - Army
 - c. Physical Requirements - Army
5. Aptitudes
 - a. Abilities, Aptitudes, Traits - Navy, Air Force
 - b. Mental Requirements - Army
 - c. Physical Requirements - Army
6. Personal Traits
 - a. Abilities, Aptitudes, Traits - Navy, Air Force
 - b. Mental Requirements - Army
7. Subjects of Interest for Further Study
 - a. Abilities, Aptitudes, Traits - Navy, Air Force
 - b. Areas of Study - Navy
 - c. Knowledge and Skills Gained - Air Force
 - d. Knowledge and Skills Gained - Army
8. Planned Educational Attainment
 - a. Abilities, Aptitudes, Traits - Navy, Air Force
 - b. Mental Requirements - Army

Table 3

Major Topic Headings - Occupational, College, and Trade School Scripts

Occupational Preference Script

1. activities
2. aptitudes
3. physical demands
4. working conditions
5. education
6. salary
7. security

College Preference Script

1. geographic location
2. type of affiliation
3. sex of student body
4. size of student body
5. type of programs
6. availability of financial aid
7. environment (urban, suburban, or rural)
8. special courses of study
9. extracurricular activities
10. academic standing of present freshmen
11. preferred college major available

Trade School Preference Script

1. school location
2. type of school
3. school program and facilities
4. tuition expense
5. financial aid
6. duration of program
7. living accommodations
8. composition of student body
9. enrollment date
10. educational plans

the template. Shown in Table 1 is the variable list for the Military File, Table 2, the categorization of the relevant variables for the preference script. Listed in Table 3 are the major topic headings for the Occupational, College, and Trade School Preference Scripts.

Once there is a tentative list of categories, then look at the coded data to determine the relevancy of each heading. Categories should be eliminated if the data are incomplete. If more than ten percent of the record names do not code the item or specify 'no information,' then the category should be eliminated. For example, if the question topic 'religious affiliation' is applicable for only 40 percent of the schools in the data base, then this category should not be included as a selection factor.

Writing a preference script question consists of two processes, stating the explanatory text and listing the options. Some questions are such that there is little distinction between these two areas. Although the coding should be completed before the options are specified, the explanatory text can be prepared at any time.

Conciseness and simplicity are desired in a script. Although a script employing an information writing style is more effective in relating to inquirers, there is a difference between personal self assessment statements and the use of personal pronouns in objective statements. Some inquirers in the field test situation differentiated between personally worded self evaluation questions and those pertaining to objective criteria. For example, the Occupational Preference Script concentrates on personal assessment, i.e., "I am not good in math," whereas the College Preference Script consists of personalized objective questions, i.e., "Would you like a school with an emphasis in medicine?" Presumably questions can be worded either objectively or subjectively, but the latter form has a greater emotional and psychological effect on the inquirer.

Several processes are involved in defining the choice options for a question, the first being to scan the data and to key the appropriate lists for each question. Shown below, for example, are the eight topic headings for the Military Preference Script and the list references.

<u>Topic Headings</u>	<u>List Used</u>
1. Work location	5
2. High school background (course work)	6
3. Work experience	7, 15, 19, 22
4. Physical attributes	11, 23, 24
5. Aptitudes	11, 23, 24
6. Personal traits	11, 23
7. Subjects of interest for further study	11, 12, 17, 25
8. Planned educational attainment	11, 23

Next, the coded data for each question need to be categorized into choice options. These options should represent a significant fraction of the coded schools or jobs. An option with fewer than five percent of these record names should not be included. As an example, the item 'no allergies' from the Physical Qualities question of the Military Script should be eliminated since it is applicable for only two or three career fields out of a total of 170. Similarly, the option 'Jewish affiliated schools' should be dropped from the College Script question of religious preference since it again references a very limited number of schools. Twenty percent to eighty percent is the best range of representation. If a specific option has a greater applicability than eighty percent, it indicates that it is not enough of a discriminating factor.

Generally in classifying the items for a particular choice option, there should be the broadest possible inclusion, with items not only of specific reference, but also of peripheral relevance. For example, if classifying military jobs for the options 'work indoors' and 'work outdoors', jobs that are performed both indoors and outdoors should be included on both lists. Table 4 gives some example items for these two options of the military work location question.

Categorizing the options may prove to be a difficult task if the information is of a specific or technical nature or if subcategories need to be devised. For instance, the question pertaining to subjects of interest for further study in the Military Preference Script involved classifying 558 items from three lists. These 558 items were placed into 62 categories and then subsumed under 11 general subject headings. The

Table 4

Example List Items for Two Options of the Work Location Question
of the Military Preference Script

List 5 - Places of Work

Work on Land

- 01 on advanced bases
- 05 on airfields
- 07 at amphibious bases
- 09 in aviation activities
- 10 in aviation units
- 11 in bake shops
- 13 in the Bureau of Naval Weapons
- 14 in butcher shops
- 18 in combat information centers
- 19 in chaplains' offices
- 20 in construction units
- 21 in dental offices on all types of ships and shore stations
- 22 in dispensaries on all types of ships and shore stations
- 27 in the Executive offices
- 31 in foundries
- .
- .
- .

Work at Sea

- 02 on aircraft carriers
- 04 in all parts of the ship
- 06 on all types of ships
- 12 on the bridge of all types of ships
- 15 in chart houses
- 16 on cruisers
- 17 on boats
- 21 in dental offices on all types of ships and shore stations
- 22 in dispensaries on all types of ships and shore stations
- 23 on the deck of all types of ships
- 24 on destroyers
- 25 on destroyer-escorts
- 26 in engine rooms
- 27 in the Executive offices
- 30 on fighting ships
- .
- .
- .

classification proved to be difficult as there was a strong tendency on the part of the coder to assign an item to a category on the basis of familiarity with a career field information rather than on its face value. Because many items were difficult to classify, it was continually necessary to revise the category headings for greater inclusiveness.

Structuring the Script Organization

In structuring the organization of a preference script, some aspects to consider are: the question sequence, the introductory and instructional material, the list presentation format, and the routing of the inquirer through the script.

Should the inquirer select which questions to answer or should he respond to all questions? By allowing a choice, the factors which the inquirer considers to be of significance in selecting a job or college are indicated immediately. On the other hand, by exposing him to an entire set of questions, there may be a change in his valuing process because of the consideration of factors of which he had formerly been unaware.

A preference script may combine both the choice and fixed sequence features in several different ways. For example, the script may be fixed choice for the inquirer on his first time through and change to choice options on subsequent rounds. Or, the script may program the inquirer through a certain set of questions and then allow a choice among the remaining questions. In the ISVD, the Military Preference Script is of the fixed choice pattern; the College Preference, choice option; Occupational Preference, a combination of fixed choice and choice option; and Trade School Preference, structured routing on the first exposure, and choice option after the first time through.

The nature of the introductory material is of importance. If it makes reference to a list of schools or jobs that the inquirer will receive upon responding to the questions, then it must stress that the schools or jobs on the list are merely possibilities for him to consider. The relationship between the selected choices for each question and the resulting list should be clearly defined in the inquirer's mind so that the list entries are not perceived as being the "right" answers prescribed by the machine.

If there are to be two or more preference scripts, there should be a standardized set of instructions for script users. A consistent uniform approach will enable the inquirer to interact in the most efficient manner with the material. The number of spaces to insert between each typed response to a question, the use of send block, the input to denote that prior answers for a question are to be retained, and the proper response to indicate that none of the choices are appropriate are some of the types of instructions that need to be spelled out.

After the inquirer logs through the introduction, the instructional material, and the questions, he comes to the list presentation section of the script. In the ISVD system, there are basically three steps to which the inquirer is routed. One is for the inquirer who has eliminated all the entries from his list. This step discusses the need for being less particular in stipulating selection criteria, and then affords the inquirer the option of starting the script over again or selecting another activity within the system. The second type of step pertains to the inquirer with ten or less entries on his list. After the list is shown he may select one of several options -- to see a template description of a particular school or job, to do the script over again, or to move on to another activity. For the inquirer who has more than ten entries on his list, he is first informed of the number of schools or jobs on his list and then shown the first ten of these items. Following, he may make one of these choices -- to see a specific template description, to see another ten of the list entries, to do the preference script over again, or to select another activity in the system.

The list presentation format may be altered in many ways. Also, different versions of the steps may be implemented for users interacting at different times with the script.

Routing the inquirer through a preference script involves segmenting the script into units and providing access to specific units at appropriate points of interaction. Providing variations of the script material for users at different stages of exploration will result in a routing pattern of greater detail and intricacy. For instance, a script may be comprised of two types of text, one for the first time user and an abridged form for users on subsequent trials. Also, certain segments of a script may be individualized for a greater number of interactions than

other parts of the script. For example, the variations of the instructional material might range from giving the complete text on the first exposure to merely posing the question, "Do you need to review the instructions?" for users on the third or fourth time through. Individualizing for reading levels, cultural backgrounds, and different value and interest areas are other ways in which the script may become more responsive to the inquirer.

The degree to which the inquirer is able to determine the nature and the sequence of activities in his interaction with the preference material also affects the complexity of the routine pattern. Two areas of consideration, for example, are whether an inquirer can access his list at any time during the question process and whether he can change his options to a prior question upon seeing his list.

Another factor which would further individualize a preference script is to relate the inquirer's school background record to the script so that factors such as College Board scores, overall grade point average, and courses taken may aid in the selection process. During the field test, several inquirers assumed that their personal data formed a segment of the preference script's screening process.

Specifying the Documentation

The specification of the documentation involves indicating which items on a list(s) are to constitute the category choice options for each question of a preference script, in other words, the codes that make each option a uniquely selective one. For example, if a question pertains to geographic location, and the inquirer is to indicate which regions he prefers for college attendance, the schools situated in each of the regions need to be identified in a particular format. This documentation takes the form of level 1 records and is often done in conjunction with the selection of the choice options, a topic discussed earlier in this section.

It is in the specification of level 1 records that the original organization of the lists is of importance. If the items were coded according to a specific classification scheme, then the task of documenting the level 1 records is easily facilitated. In setting up the record specifications, the following format is used. The name of the record is listed first, followed by the phrase,

"a 1 if columns (insert column numbers), card (insert card number) have: (insert the specific coded items from the appropriate lists)"

If the list is organized, such as the H.S. Courses List, in which all science subjects are coded from 70-79, math, 80-89, etc., then it would be only necessary to indicate in the specification of the Math Level 1 record, "a 1 if column 68, card 1 has an 8". Otherwise, it will be necessary to list each particular number in the coding assigned to a math subject, as for example, "a 1 if columns 68-70, card 1 have: 319, 415, 527, 636, 749, 924". Examples of level 1 specifications for the preference scripts in the ISVD are shown in Table 5.

Table 5

Examples of Level 1 Record Specifications

Occupational Preference Script

UNSTRUCTURED CREATIVE WORK

A 1 if 853 tape column 1023 or 1029 or 1030 contains:

8

WORKING IN SOCIAL SITUATIONS

A 1 if 853 tape column 1028 or 1029 or 1030 contains:

4

College Preference Script

EPISCOPAL AFFILIATION

A 1 if columns 8-9, card 1 have:

24 58

LUTHERAN AFFILIATION

A 1 if columns 8-9, card 1 have:

06 40 42

Trade School Preference Script

BUSINESS - FOCUS

A 1 if focus of school in columns 12-13 of card 3 has:

03 14 19 20 21
25 31 33 34 36

Military Preference Script

WORK ON LAND

A 1 if Place of Work of card 1 has:

05 11 13 14 18 19 20 21 22 27 31 33 36 37 39 40 41 42
43 44 45 48 49 50 51 53 60 61 64 66 67 72 74 75 76 77
78 80 81 69 01 07 09 10 47

APPENDIX A

Reference Sources for the Occupation,
Education, and Military Data Bases

OCCUPATION DATA BASE
REFERENCE MATERIALS

1. The American Occupations Finder, Benson, Warren E. (ed). Research Publishing Company, Incorporated, Boston, Mass., 1964.
2. Career Facts: 1966/67, National Association of Manufacturers. Addison-Wesley Publishing Company, Reading, Mass., 1966.
3. Dictionary of Occupational Titles - Volume 1, Definitions of Titles, Manpower Administration, U.S. Department of Labor. Washington, D.C., 1965 (third edition).
4. Dictionary of Occupational Titles - Volume 2, Occupational Classification, Manpower Administration, U.S. Department of Labor. Washington, D.C., 1965 (third edition)
5. Job Facts: 1966/67, National Association of Manufacturers. Addison-Wesley Publishing Company, Reading, Mass., 1966.
6. Occupational Outlook Handbook, (1966-67 edition) Bureau of Labor Statistics, U.S. Department of Labor. Washington, D.C., 1966.
7. Revised Minnesota Occupational Rating Scales, Paterson, Gerken, Hahn. University of Minnesota Press, Minneapolis, Minn., 1953.
8. A Supplement to the Dictionary of Occupational Titles, Manpower Administration, U.S. Department of Labor. Washington, D.C., 1966 (third edition).

EDUCATION DATA BASE

REFERENCE MATERIALS

College File

1. College Admissions Data Service 1967-1968, Educational Research Corporation, Cambridge, Massachusetts.
2. Facts About New England Colleges and Universities 1967-68, The New England Board of Higher Education, 1967.

Trade School File

1. Directory, National Association of Trade and Technical Schools, Washington, D.C., 1967.
2. Individual school catalogues and brochures

MILITARY DATA BASE

REFERENCE MATERIALS

ENLISTED MEN AND OFFICERS

U.S. Army

1. Army ROTC Briefer, U.S. Army, 1965.
2. Army ROTC Scholarship Program, U.S. Army, January 1967.
3. Enlisted Military Occupational Specialties, AR 611-201, Department of the Army, January 1967.
4. Enlisted Personnel Management System, Department of the Army, March 1965.
5. Finance and Accounting for Installations Military Pay and Allowance Procedures, Department of the Army, February 1965.
6. Listing of Overstrength and Shortage Enlisted MOS for Use in Specific Personnel Actions, Department of the Army, March 1967.
7. Logical Decision - Army ROTC, U.S. Army, August 1966.
8. Manual of Commissioned Officer Military Occupational Specialties, Department of the Army, June 1960.
9. Manual of Warrant Officer Military Occupational Specialties, Department of the Army, June 1961.
10. The Officers Guide, Russel B. Reynolds, Stackpole Books, Harrisburg, Pennsylvania, 1967.
11. Promotion of Officers on Active Duty, Department of the Army, July 29, 1966.
12. The Secret of Getting Ahead, U.S. Army, July 1965.
13. Statistical and Accounting System, Department of the Army, July 12, 1962.
14. Today's Women's Army Corps - A New World of Opportunity, U.S. Army, July 1966.
15. U.S. Army Opportunities, Army Opportunities, United States Army Recruiting Command, Hampton, Virginia, 1966.
16. Welcome to Army ROTC, U.S. Army, January 1967.
17. Your Career as an Army Officer, U.S. Army, November 1965.

U.S. Navy

1. Alphabetized Listing of All General, Service, and Emergency Ratings of the U.S. Navy, Permanent Board for Control of the Enlisted Rating Structure (recorder), March 1967.
2. Career Counseling Guide, U.S. Naval Personnel Division, July 7, 1965.
3. Comparative Occupational Pay Briefs, Bureau of Naval Personnel, Department of the Navy, February 1965.
4. Facts for Figuring Your Future, Bureau of Naval Personnel, Department of the Navy, October 1, 1966.
5. Formal Schools Catalog, Bureau of Naval Personnel, Department of the Navy, 1966.
6. Junior Officers Guide to Enlisted Rights and Benefits, Career Counseling and Educational Opportunities, U.S. Naval Officer Candidate School, U.S. Naval Base, Newport, Rhode Island, March 1966.
7. The Line Officer - Navy, September 20, 1963.
8. Manual of Navy Enlisted Classifications, Bureau of Naval Personnel, Department of the Navy, February 1967.
9. Manual of Navy Officer Classifications, Bureau of Naval Personnel, Department of the Navy, 1966.
10. Manual of Qualification for Advancement in Rating, Bureau of Naval Personnel, Department of the Navy, June 1965.
11. Navy and Marine Corps Military Personnel Statistics, Bureau of Naval Personnel, Department of the Navy, February 28, 1967.
12. Navy Officer Careers Handbook, Bureau of Naval Personnel, Department of the Navy, 1964.
13. NROTC, April 1967.
14. NROTC College Program, Two Year Contract, No Date.

15. NROTC Contract College Program, January 1, 1967.
16. Officer Opportunities in the Supply Corps, U.S. Navy, No Date.
17. Polaris University Extension Program, No Date.
18. Processing Procedures for Navy Enlistments /Reenlistments, Bureau of Naval Personnel, Department of the Navy, March 14, 1967.
19. U.S. Navy Recruiting Manual - Part D - Recruiting at Advanced Pay Grades, Bureau of Naval Personnel, Department of the Navy, 1966.
20. United States Navy Occupational Handbook, Bureau of Naval Personnel, Department of the Navy, 1966.
21. Wings for the Fleet, Naval Air Training Command, January 3, 1966.

U.S. Air Force

1. Air Force Military Personnel Testing Manual, AFM 35-8, Department of the Air Force, June 15, 1962.
2. Air Force Officer Classification Structure Chart, AFVA 36-1A, U.S. Air Force, November 1966.
3. Airman Classification Manual, AFM 39-1, Department of the Air Force, Volumes 1 and 2, April 15, 1963.
4. AQE Norms for High School Seniors and Air Force Training Groups, Ernest C. Tupes, Personnel Research Laboratory, Aerospace Medical Division, Air Force Systems Command, Lackland Air Force Base, Texas, May 1965.
5. Military Personnel Classification Policy Manual (Officers, Warrant Officers, Airmen), Department of the Air Force, August 18, 1966.
6. Officer and Airmen Classification Structure, Personnel Standards Division, Classification Structures Branch.
7. Officer Classification Manual, AFM 36-1, Officer Personnel, Department of the Air Force, April 15, 1966.

8. Officer's Pay Guide, Department of the Air Force, July 1966.
9. Pilots and Navigators Stand Tall, Department of the Air Force, 1966.
10. Pocket Guide to United States Air Force Opportunities, 1967, Advertising Division (AFPMRB), U.S. Air Force Recruiting Service, Randolph Air Force Base, Texas, 1966.
11. Scientific and Engineering Opportunities for Lieutenants, United States Air Force, April 1, 1967.
12. The United States Air Force Occupational Handbook for Airmen, 1966-67, 1966.
13. USAF Formal Schools Catalog, Department of the Air Force, July 1, 1966.
14. Women Officers in the U.S. Air Force, Advertising Division, Headquarters, U.S. Air Force, 1967.

All Services

1. Occupational Conversion Table - Enlisted, Office of the Assistant Secretary of Defense, Manpower, Department of Defense, October 1966.
2. Occupational Conversion Table - Officers, Office of the Assistant Secretary of Defense, Manpower, Department of Defense, March 1967.

General References

1. Dictionary of Occupational Titles - Volume 1, Manpower Administration, U.S. Department of Labor, 1965.
2. Dictionary of Occupational Titles - Volume 2, Manpower Administration, U.S. Department of Labor, 1965.
3. Guide to the Use of the General Aptitude Test Battery, Section 111 - Development, Bureau of Employment Security, U.S. Department of Labor, October, 1962.

4. Manual for the USES General Aptitude Test Battery - Section IV Norms, Bureau of Employment Security, U.S. Department of Labor, May, 1966.
5. Occupational Outlook Handbook, Bureau of Labor Statistics, U.S. Department of Labor, 1966.
6. World Almanac, Newspaper Enterprise Association, Inc., 1967.

REFERENCE SOURCES - ENLISTED MEN

1. Information Categories

Number	Title	Army	Navy	Air Force	All Services
1	Navy General Descriptions		1,20,8		1
2	Availability for Women	3,14,15	20	12	
3	Chart Number for Navy List		20		
5	Places of Work	3,15	20	3,12	
6	High School Courses	15	20	3,12	
7	Prior Experience	15	20		
11	Abilities, Aptitudes, Traits-Navy, Air Force		20	3,12	
12	Areas of Study-Navy		20		
13	Navy Specialties		8		
14	Service Schools-Navy		20		
15	Related Civilian Jobs-Navy		20		
16	Related Navy Jobs		20		
17	Knowledge and Skills Gained-Air Force			1,3,4,12	
18	Specialized Air Force Jobs			3	
19	Related Civilian Jobs- Air Force			3	
20	Air Force General Descriptions			3,12	1
21	Army General Descriptions	3,15			1
22	Related Civilian Jobs-Army	3			
23	Mental Requirements-Army	3			

1. Information categories, cont.

Number	Title	Army	Navy	Air Force	All Services
24	Physical Requirements-Army	3			
25	Knowledge and Skills Gained-Army	3,15			
26	Specialized Army Jobs	3			
27	Personnel Requirements-Army	6			

2. Scripts: Introduction to Military
and Individual Cover Statements

Army	Navy	Air Force	General Reference
12,14, 15	20,4	12,8,10	6

APPENDIX B

A Procedure for Writing Job Descriptions by Computer
Templates

A PROCEDURE FOR WRITING JOB DESCRIPTIONS BY COMPUTER

Laurence Wolff

This memorandum suggests a procedure to enable a computer to write 850+ job descriptions in English sentences and paragraphs, based entirely on the 31 items of the CSED occupational data base (see "User's Manual for Occupational Descriptions," March 30, 1967) and on the 17 items on the tape of the Dictionary of Occupational Titles (see "Description of the Tape of the Dictionary of Occupational Titles," March 9, 1967).

The descriptions are not final products but examples of what is possible with the information now available. For use with students, the IS/D will have to simplify them and prepare alternate description forms for different situations. We also need to prepare CAI scripts to teach students about occupational terminology (in accordance with O'Hara's paper, "A Theoretical Foundation for the Use of Occupational Information in Guidance").

CSED would appreciate suggestions not only about the general format of the descriptions given here but also about the relevance of this information to students. The descriptions as they stand now contain most of the occupational information currently available.

* * *

Included here are examples of two job descriptions (for jobs with a great deal of information available). The underlined portions vary according to the information in the data base. Each such portion is numbered and explained in the generalized description and index which begins on page 87. These descriptions are tentative and need careful development and programming. Based on available coded information, similar descriptions for all 850+ jobs in the data base are possible with this procedure.

A Guide to Wolff

The essential structure of the Wolff script is non interactive. It is designed to make use of available information about jobs. The codes given in the text are those used in the original data.

The computer is used to look up the codes and then translate the information into English. This is then placed in the appropriate spaces in the paragraph to create the description.

All the routines suggested were written except the "pluralizer". These are available for other uses. The script is a good guide to the type of information about jobs we have stored.

SAMPLE JOB DESCRIPTION I - DOCTOR

DOCTORS (2p) ARE PROFESSIONALS WHO WORK (2a) IN MEDICAL SERVICES, GOVERNMENT, AND COLLEGES AND UNIVERSITIES (6). THEIR WORK IS SCIENTIFIC AND TECHNICAL, AND INVOLVES THEM WITH PEOPLE (9). ON THE JOB THEY DIAGNOSE, AND PRESCRIBE MEDICATION FOR DISEASES, TREAT INJURIES, AND DO SURGERY (7).

A DOCTOR (2) MUST COMPLETE PROFESSIONAL OR GRADUATE SCHOOL (17) BEFORE ENTERING HIS OCCUPATION. HE NEEDS 4 TO 10 YEARS OF (DOT 12) SPECIFIC TRAINING FOR HIS JOB AND THEN 6 MONTHS TO 1 YEAR (16) OF ON-THE-JOB TRAINING BEFORE BEING CONSIDERED A FULL-FLEDGED DOCTOR (2s). BEFORE BECOMING A DOCTOR (2s) HE GOES THROUGH A PERIOD OF FORMAL EDUCATION AND TRAINING; (15) THEREFORE, THERE ARE NO JOBS WHICH A PERSON NEEDS TO HOLD BEFORE BECOMING A DOCTOR (2s). (4) WITH MORE EDUCATION (28) HE CAN OFTEN EXPECT TO BECOME A SURGEON, A NEUROLOGIST, A HEAD PHYSICIAN, OR A PEDIATRICIAN. (5) A HIGH SCHOOL STUDENT INTERESTED IN BECOMING A DOCTOR (2s) SHOULD CONSIDER TAKING THE FOLLOWING COURSES: BIOLOGY, LATIN, CHEMISTRY, FOREIGN LANGUAGES, PHYSICS, AND SOCIAL STUDIES (10).

A BEGINNING DOCTOR (2s) CAN EXPECT TO MAKE AT LEAST \$6500 PER YEAR, (11a, 12a, 13a) AND MAY EVENTUALLY MAKE A MAXIMUM OF \$70000 PER YEAR (11b, 12b, 13b). SINCE MANY DOCTORS (2p) ARE SELF-EMPLOYED, HE CAN SOMETIMES SET THE NUMBER OF HOURS HE WISHES TO WORK AND THEREFORE VARY HIS INCOME (29, 26, 25).

A DOCTOR (2s) SHOULD HAVE VERY GOOD GENERAL INTELLIGENCE, VERBAL ABILITY, AND ABILITY TO SEE THINGS IN SPACE OR PICTURES (DOT 10). HE SHOULD ALSO HAVE GOOD NUMERICAL ABILITY AND ABILITY TO WORK WITH HIS FINGERS (DOT 10). HIS JOB USUALLY REQUIRES HIM TO MAKE DECISIONS ON THE BASIS OF HIS OWN JUDGMENT, TO MAKE DECISIONS ON THE BASIS OF OBJECTIVE INFORMATION, AND TO DEAL DIRECTLY WITH PEOPLE (DOT 13). A DOCTOR (2s) DOES NOT HAVE TO BE VERY STRONG, BUT (DOT 14a) AND HE IS EXPECTED TO TALK, LISTEN, LOOK AND USE HIS HANDS (DOT 14b) EFFECTIVELY.

KEEP IN MIND THE FOLLOWING IMPORTANT INFORMATION ABOUT DOCTORS (2p):

- a. CURRENT INFORMATION INDICATES THAT IN THE FUTURE THERE WILL BE AN INCREASING (31) DEMAND FOR DOCTORS (2p).
- b. 70 TO 95% (19) OF ALL DOCTORS (2p) ARE MEN (19).

- c. DOCTORS (2p) SOMETIMES (24) TRAVEL OVERNIGHT OR LONG DISTANCES.
- d. DOCTORS (2p) OFTEN WORK NIGHTS AND WEEKENDS (22, 23).
- e. DOCTORS (2p) SOMETIMES (DOT 15a) WORK OUTDOORS.
- f. DOCTORS (2p) ARE LICENSED BY THE STATE (20).

SAMPLE JOB DESCRIPTION II - FOURDRINIER-MACHINE TENDER

FOURDRINIER-MACHINE TENDERS (2p) ARE PROCESSING WORKERS (2a) IN THE PAPER PRODUCTS INDUSTRY (6). THEIR WORK REQUIRES THEM TO DEAL WITH THINGS AND OBJECTS RATHER THAN WITH PEOPLE OR IDEAS (9). ON THE JOB THEY OPERATE THE WET END OF PAPER MAKING MACHINES. THEY CHECK PAPER QUALITY AND SUPERVISE RELATED MACHINE OPERATORS (7).

A FOURDRINIER-MACHINE TENDER (2s) MUST COMPLETE JUNIOR HIGH SCHOOL (17) AND SHOULD ALSO GRADUATE FROM A VOCATIONAL HIGH SCHOOL (18) BEFORE ENTERING HIS OCCUPATION. HE NEEDS 6 MONTHS TO 1 YEAR OF (DOT 12) SPECIFIC TRAINING FOR HIS JOB. BEFORE BECOMING A FOURDRINIER-MACHINE TENDER (2s), HE USUALLY HOLDS ANOTHER JOB; (15) SOME OF THE JOBS WHICH HE CAN HOLD BEFORE BEING PROMOTED ARE INSULATION-BOARD BACKTENDER, FILTRATION HELPER, AND PACKAGING LABORER (4). WITH ON-THE-JOB TRAINING OR TIME ON THE JOB (28) HE CAN OFTEN EXPECT TO BECOME A PAPER MACHINE FOREMAN, WET ROOM FOREMAN, OR PRODUCTION FOREMAN (5). A HIGH SCHOOL STUDENT INTERESTED IN BECOMING A FOURDRINIER-MACHINE TENDER (2s) SHOULD CONSIDER TAKING THE FOLLOWING COURSES: CHEMISTRY, MATHEMATICS, PHYSICS, GENERAL SCIENCE, AND SHOP (10).

A BEGINNING FOURDRINIER-MACHINE TENDER (2s) CAN EXPECT TO MAKE AT LEAST \$2.64 PER HOUR (11a, 12a, 13a) AND MAY EVENTUALLY MAKE A MAXIMUM OF \$5.70 PER HOUR (11b, 12b, 13b). IN ADDITION HE MAY RECEIVE HEALTH AND LIFE INSURANCE AND PAID VACATIONS, AND A SHARE IN THE COMPANY'S PROFITS (27).

A FOURDRINIER-MACHINE TENDER (2s) SHOULD HAVE AVERAGE GENERAL INTELLIGENCE, ABILITY TO SEE THINGS IN SPACE, OR PICTURES, AND ABILITY TO MOVE HIS EYES AND HANDS AND FINGERS TOGETHER (DOT 10). HIS JOB USUALLY REQUIRES HIM TO MAKE DECISIONS ON THE BASIS OF OBJECTIVE INFORMATION AND TO DO PRECISE WORK ACCORDING TO INSTRUCTIONS (DOT 13). A FOURDRINIER-MACHINE TENDER (2s) SHOULD BE FAIRLY STRONG, AND (DOT 14a) HE IS EXPECTED TO USE HIS HANDS (DOT 14b) EFFECTIVELY.

KEEP IN MIND THE FOLLOWING IMPORTANT INFORMATION ABOUT FOURDRINIER-MACHINE TENDERS (2p):

- a. CURRENT INFORMATION INDICATES THAT IN THE FUTURE THERE WILL BE NO CHANGE IN THE (31) DEMAND FOR FOURDRINIER-MACHINE TENDERS (2p).
- b. 70 TO 95% (19) OF ALL FOURDRINIER-MACHINE TENDERS (2p) ARE MEN (19).

- c. FOURDRINIER-MACHINE TENDERS (2p) OFTEN WORK NIGHTS AND WEEK-
ENDS (22, 23).
- d. FOURDRINIER-MACHINE TENDERS (2p) USUALLY BELONG TO UNIONS (21).
- e. FOURDRINIER-MACHINE TENDERS (2p) ARE SUBJECT TO WET AND HUMID
CONDITIONS (DOT 15b) WHILE ON THEIR JOB.

INDEX TO GENERALIZED JOB DESCRIPTIONS

If this system is put into actual operation, it will require considerable programming effort between NEEDS and CSED. The following routines would probably have to be developed:

- a. a routine for a "series" of answers, which places commas correctly and precedes the last part of the series with "and".
- b. a routine to pluralize job titles.
- c. a routine to precede singular job titles by "a" or "an".
- d. a routine for female inquirers which uses the female personal pronouns.
- e. a routine to blank out an entire sentence or a part of it when an item is coded "no information."
- f. a routine to invert job titles (e.g., change "welder, arc" in the data base to "arc welder").

In this index each sentence of the description (in capital letters) is followed by an explanation of its coding according to the "User's Manual for Occupational Descriptions" and the "Description of the Tape of the Dictionary of Occupational Titles." The numbers used refer directly to items in these two documents, and they should be referred to for details. The following is a listing of items and numbers from the "User's Manual for Occupational Descriptions."

1. Identification number
2. Job title
 - 2s. Job title in singular
 - 2p. Job title in plural
 - 2a. DOT number of job title
3. Alternate titles
4. Lower jobs
5. Higher jobs
6. Industries
7. Job description
8. Worker trait sector
9. Interests
10. High school courses
11. Hourly wage

- 11a. Lowest
- 11b. Highest
- 12. Weekly wage
 - 12a. Lowest
 - 12b. Highest
- 13. Yearly wage
 - 13a. Lowest
 - 13b. Highest
- 14. Occupational rating scales
- 15. Previous activity
- 16. On-the-job training
- 17. Education required
- 18. Education preferred
- 19. Sex
- 20. Licensing requirements
- 21. Union membership
- 22. Weekend work
- 23. Night work
- 24. Travel
- 25. Seasonal fluctuation
- 26. Basis of income
- 27. Incentives
- 28. Promotion paths
- 29. Self-employment
- 30. Future growth
- 31. Future demand for new workers

The following items are from the "Description of the Tape of the Dictionary of Occupational Titles:"

- DOT 1. Identification number
- DOT 2. Job title
- DOT 3. Industry designation
- DOT 4. Alternate job title number
- DOT 5. Worker functions
- DOT 6. Work fields
- DOT 7. DOT number from third edition

- DOT 8. DOT number from second edition
- DOT 9. Worker trait sector
- DOT 10. Aptitudes
- DOT 11. General educational development
- DOT 12. Specific vocational preparation
- DOT 13. Temperaments
- DOT 14. Physical demands
 - 14a. Strength (1st column)
 - 14b. Other physical demands (last 5 columns)
- DOT 15. Working Conditions
 - 15a. Indoor or outdoor work (1st column)
 - 15b. Other working conditions (last 6 columns)
- DOT 16. Materials, products, subject matter, and services
- DOT 17. "Tie Code"

- _____ (2p) ARE _____ (2a) IN _____ (6)
- 2p. Job Title. Requires a routine for pluralization and for inversion. Also, in some cases the Job Title is too long or complicated for efficient presentation and will have to be replaced by a simpler title.
- 2a. DOT number of Job Title. The first two digits of the 6-digit DOT number of the Job Title should be interpreted as follows:
- 00-15, 19 = PROFESSIONALS WHO WORK
 - (if 4th digit is 2 to 8 and 5th digit is 3 to 8) = SEMI-PROFESSIONALS OR TECHNICAL WORKERS
 - 16 = ADMINISTRATORS WHO WORK
 - 18 = MANAGERS WHO WORK
 - 20-24 = CLERICAL WORKERS
 - 25-29 = WORKERS
 - 30-38 = SERVICE WORKERS
 - 40-46 = AGRICULTURAL WORKERS
 - 50-59 = PROCESSING WORKERS
 - 60-69 = MACHINE WORKERS
 - 70-79 = BENCH WORKERS
 - 80-89 = STRUCTURAL WORKERS
 - 90-97 = WORKERS
6. Industries. One to 4 industries may be coded. The 1 digit or 2 digit SIC code should be used most of the time, since the 3 digit code is usually too detailed. Since the data base contains mostly 3 digit titles and codes, a list of 2 digit titles and numbers must be prepared. The following is the beginning of such a list:
- 9bb = GOVERNMENT (b = blank)
 - 11 = THE COAL MINING INDUSTRY
 - 26 = THE PAPER PRODUCTS INDUSTRY
 - 35 = THE ELECTRICAL MACHINERY INDUSTRY
 - 82 = EDUCATION
 - 821 = ELEMENTARY AND SECONDARY SCHOOLS
 - 822 = COLLEGES AND UNIVERSITIES
- THEIR WORK _____ (9)
9. Interests. One to 3 Interests may be coded.

- 1 = REQUIRES THEM TO DEAL WITH THINGS AND OBJECTS RATHER THAN
WITH PEOPLE OR IDEAS
- 2 = INVOLVES THEM IN BUSINESS
- 3 = IS CONCRETE AND ORGANIZED
- 4 = INVOLVES THEM WITH PEOPLE
= omit if 6 is present
- 5 = omit
- 6 = REQUIRES THEM TO DEAL WITH PEOPLE AND IDEAS RATHER THAN
WITH THINGS AND OBJECTS
- 7 = IS SCIENTIFIC AND TECHNICAL
- 8 = IS ABSTRACT AND CREATIVE
- 9 = INVOLVES THEM WITH MACHINES AND TECHNIQUES
= omit if 1 is present
- 0 = omit

ON THE JOB THEY _____ (7)

7. Job Description. The job title which begins the description should be deleted.

A _____ (2s) MUST _____ (17) AND SHOULD ALSO
_____ (18) BEFORE ENTERING HIS OCCUPATION.

17. Education Required.

If blank, omit sentence.

- 1 = COMPLETE JUNIOR HIGH SCHOOL
- 2 = GRADUATE FROM AN ACADEMIC HIGH SCHOOL
(If Education Preferred (18) is 3) = MUST GRADUATE FROM
EITHER AN ACADEMIC OR A VOCATIONAL HIGH SCHOOL
- 3 = GRADUATE FROM A VOCATIONAL HIGH SCHOOL
(If Education Preferred (18) is 2) = MUST GRADUATE FROM
EITHER AN ACADEMIC OR A VOCATIONAL HIGH SCHOOL
- 4 = ATTEND A BUSINESS SCHOOL
- 5 = ATTEND A TECHNICAL SCHOOL
- 6 = ATTEND A JUNIOR COLLEGE
- 7 = GRADUATE FROM COLLEGE
- 8 = COMPLETE GRADUATE OR PROFESSIONAL SCHOOL
- 9 = blank

18. Education Preferred.

If blank, omit "AND SHOULD ALSO"

If Education Preferred is same as Education Required = blank

If Education Preferred is 3 and Education Required is 2 = blank

If Education Preferred is 2 and Education Required is 3 = blank

- 1 = COMPLETE JUNIOR HIGH SCHOOL
- 2 = GRADUATE FROM AN ACADEMIC HIGH SCHOOL
- 3 = GRADUATE FROM A VOCATIONAL HIGH SCHOOL
- 4 = ATTEND A BUSINESS SCHOOL
- 5 = ATTEND A TECHNICAL SCHOOL
- 6 = ATTEND A JUNIOR COLLEGE
- 7 = GRADUATE FROM COLLEGE
- 8 = COMPLETE GRADUATE OR PROFESSIONAL SCHOOL
- 9 = blank

HE NEEDS _____ (DOT 12) SPECIFIC TRAINING FOR HIS JOB AND THEN
_____ (16) OF ON-THE-JOB TRAINING BEFORE BEING CONSIDERED A FULL-
FLEDGED _____ (2s).

DOT 12. Specific Vocational Preparation.

- 1 = NO
- 2 = UP TO 30 DAYS OF
- 3 = 30 DAYS TO 3 MONTHS OF
- 4 = 3 TO 6 MONTHS OF
- 5 = 6 MONTHS TO 1 YEAR OF
- 6 = 1 TO 2 YEARS OF
- 7 = 2 TO 4 YEARS OF
- 8 = 4 TO 10 YEARS OF
- 9 = OVER 10 YEARS OF

16. On-the-Job Training.

If blank, omit "AND THEN _____ (16) OF ON-THE-JOB TRAINING"

- 1 = blank
- 2 = UP TO 30 DAYS
- 3 = 1 TO 3 MONTHS
- 4 = 3 TO 6 MONTHS
- 5 = 6 MONTHS TO 1 YEAR

- 6 = 1 TO 2 YEARS
- 7 = 2 TO 4 YEARS
- 8 = OVER 4 YEARS
- 9 = blank

BEFORE BECOMING A _____ (2s) HE _____ (15); SOME OF THE JOBS WHICH HE CAN HOLD BEFORE BEING PROMOTED ARE _____ (4)

15. Previous Activity. Use only the first number coded.

If blank, omit "BEFORE BECOMING A _____ (2s), HE _____ (15);

- 1 = GOES THROUGH A PERIOD OF FORMAL EDUCATION AND TRAINING
- 2 = USUALLY HOLDS ANOTHER JOB
- 3 = USUALLY BEGINS AS AN APPRENTICE
- 8 = NEEDS NO FORMAL EDUCATION OR JOB EXPERIENCE
- 9 = blank

4. Lower Jobs. Zero to 4 jobs may be coded.

If Previous Activity is 1 or 8 and Lower Jobs is blank, replace part of sentence beginning with "SOME OF THE . . ." with "THEREFORE THERE ARE NO JOBS WHICH A PERSON CAN HOLD BEFORE BECOMING A _____ (2s)." Otherwise, if blank, omit "SOME OF THE . . ." and change semi-colon to period.

8, 9 = blank

WITH _____ (28) HE CAN OFTEN EXPECT TO BECOME _____ (5)

28. Promotion Paths. Zero, 1, or 2 may be coded. Connect with "OR" if two are coded.

If blank, omit "WITH".

- 1 = blank
- 2 = ON-THE-JOB TRAINING
- 3 = SPECIAL TRAINING
- 4 = MORE EDUCATION
- 5 = TIME ON THE JOB
- 8, 9 = blank

5. Higher Jobs. Zero to 4 jobs may be coded. Place "A" or "AN" before each job title.

If blank, omit sentence.

8, 9 = blank

A HIGH SCHOOL STUDENT INTERESTED IN BECOMING A _____ (2s) SHOULD
CONSIDER TAKING THE FOLLOWING COURSES: _____ (10)

10. High School Courses. Write "course" if "1" is coded. Up to 36
courses may be coded.

If blank, omit sentence

9 (in column 1) = blank

A BEGINNING _____ (2s) SHOULD EXPECT TO MAKE AT LEAST _____
(11a, 12a, 13a) AND MAY EVENTUALLY MAKE A MAXIMUM OF _____ (11b, 12b,
13b).

11a, 12a, 13a. Hourly Wage, Weekly Wage, Yearly Wage -- Lowest. If more
than one Lowest Wage is coded, the figures for the longest period of
time should be used.

If no Lowest Wage is coded, omit "BEGINNING . . . SHOULD EXPECT TO
MAKE AT LEAST _____ AND"

13a. \$ _____ PER YEAR (Yearly Wage)

12a. \$ _____ PER WEEK (Weekly Wage)

11a. \$ _____ PER HOUR (Hourly Wage)

11b, 12b, 13b. Hourly Wage, Weekly Wage, Yearly Wage -- Highest. If more
more than one Highest Wage is coded, use the figures for the longest
period of time.

If 11a, 12a, 13a, 11b, 12b, 13b are blank, omit sentence.

If only 11b, 12b, 13b are blank, omit "AND MAY EVENTUALLY MAKE A
MAXIMUM OF _____."

If 11b, 12b, 13b do not have figures for the same period of time as
11a, 12a, 13a = blank

13b. \$ _____ PER YEAR (Yearly Wage)

12b. \$ _____ PER WEEK (Weekly Wage)

11b. \$ _____ PER HOUR (Hourly Wage)

IN ADDITION HE MAY RECEIVE _____ (27)

27. Incentives. Zero to 4 Incentives may be coded.

If 11a, 12a, 13a, 11b, 12b, 13b are blank, omit "IN ADDITION."

If blank, omit sentence

50 = HEALTH AND LIFE INSURANCE AND PAID VACATIONS

- 01 = FREE HOUSING
- 02 = FREE MEALS
- 03 = FREE UNIFORMS
- 04 = TIPS
- 05 = BONUSES
- 06 = OVERTIME PAY
- 07 = HEALTH INSURANCE
- 08 = LIFE INSURANCE
- 09 = A SHARE IN THE COMPANY'S PROFITS
- 10 = FREE ADVANCED TRAINING
- 11 = FREE FURTHER EDUCATION
- 12 = PAID VACATIONS AND HOLIDAYS
- 13 = PENSIONS AT RETIREMENT
- 14 = STOCK OPTIONS
- 15 = DISCOUNTS
- 16 = EXPENSE ACCOUNTS
- 17 = TRAVELING EXPENSES
- 97, 98, 99 = blank

SINCE MANY _____ (2p) ARE SELF-EMPLOYED, HE CAN SOMETIMES SET THE NUMBER OF HOURS HE WISHES TO WORK AND THEREFORE VARY HIS INCOME (29).

29. Self-employment.

- 1 = (use sentence)
- 2 , 9 = (omit sentence)

SINCE _____ (2p) ARE OFTEN PAID BY COMMISSION, HE CAN VARY HIS INCOME GREATLY OVER A SHORT PERIOD OF TIME (26).

26. Basis of Income.

- 2, 4 = (use sentence)
 - = (omit sentence if Self-employment = 1)
- 3 = (use sentence, but omit "often")
 - = (omit sentence if Self-employment = 1)
- 1, 5, 9 = (omit sentence)

HIS INCOME ALSO VARIES WITH THE PARTICULAR SEASON OF THE YEAR (25).

25. Seasonal Fluctuation.

1 = (use sentence; omit "ALSO" if Self-employment or Basis
of Income do not require sentences)

2, 9 = (omit sentence)

A _____ (2s) SHOULD HAVE _____ (DOT 10).

DOT 10. Aptitudes. Print only those Aptitudes coded 1, 2, or 3. If more than 6 are coded 1, 2, and 3, print only those coded 1 and 2. All aptitudes with the same number should be combined in the same series preceded by "VERY GOOD", "GOOD", or "AVERAGE".

If more than three Aptitudes are printed, two sentences should be generated, the second being, "HE SHOULD ALSO HAVE _____ (DOT 10). In this case all Aptitudes coded 1 should be in the first sentence; Aptitudes coded 2 should be in the first or second sentence (a procedure can be developed to assign them to the sentence which has the least Aptitudes); and Aptitudes coded 3 should be in the second sentence.

1 = VERY GOOD

3 = AVERAGE

2 = GOOD

4 = OMIT

Aptitudes coded:

a = GENERAL INTELLIGENCE

b = VERBAL ABILITY

c = NUMERICAL ABILITY

d = ABILITY TO SEE THINGS IN SPACE IN PICTURES

= omit if e is lower than d

e = ABILITY TO SEE THINGS IN PICTURES OR SPACE

= omit if d is lower than e

f = CLERICAL ABILITY

g = ABILITY TO MOVE HIS EYES AND HANDS AND FINGERS TOGETHER

h = ABILITY TO WORK WITH HIS FINGERS

= omit if g is printed

i = ABILITY TO WORK WITH HIS HANDS

= omit if g is printed

j = omit

k = ABILITY TO SEE DIFFERENT COLORS

HIS JOB USUALLY REQUIRES HIM TO _____ (DOT 13).

DOT 13. Temperaments. One to 5 may be coded.

- 1 = DO MANY THINGS IN A SHORT PERIOD OF TIME
- 2 = DO ROUTINE WORK
- 3 = FOLLOW INSTRUCTIONS CAREFULLY
- 4 = PLAN WHAT OTHER PEOPLE SHOULD DO
- 5 = DEAL DIRECTLY WITH PEOPLE
- 6 = WORK ALONE
- 7 = INFLUENCE PEOPLE
- 8 = WORK UNDER PRESSURE
- 9 = MAKE DECISIONS ON THE BASIS OF HIS OWN JUDGMENT
- 10 = MAKE DECISIONS ON THE BASIS OF OBJECTIVE INFORMATION
- X = INTERPRET THINGS PERSONALLY
- Y = DO PRECISE WORK ACCORDING TO INSTRUCTIONS

A _____ (2s) _____ (DOT 14a) HE IS EXPECTED TO _____
(DOT 14b) EFFECTIVELY.

14a. Physical Demands (Strength). From the 1st column of Physical Demands.

S, L = DOES NOT HAVE TO BE VERY STRONG, BUT

M = SHOULD BE FAIRLY STRONG, AND

H, V = SHOULD BE VERY STRONG, AND

14b. Physical Demands. From the last 5 columns of Physical Demands. One to 5 may be coded. Print in the following order:

5 = TALK, LISTEN

= (If no other Physical Demands are coded) = TALK AND LISTEN

6 = LOOK

4 = USE HIS HANDS

3 = USE HIS BODY

2 = CLIMB AND BALANCE HIMSELF

KEEP IN MIND THE FOLLOWING IMPORTANT INFORMATION ABOUT _____ (2p):
(Following this statement each sentence printed should be lettered sequentially from a to g.)

CURRENT INFORMATION INDICATES THAT IN THE FUTURE THERE WILL BE _____ (31)

DEMAND FOR _____ (2p).

31. Demand for New Workers.

If blank, omit sentence.

- 1 = A DECLINING
- 2 = NO CHANGE IN THE
- 3 = AN INCREASING
- 4 = A CONTINUOUS HIGH
- 9 = blank

_____ (19) OF ALL _____ (2p) ARE _____ (19).

19. Sex.

If blank, omit sentence.

- 1 = 95-100% . . . MEN
- 2 = 70-95% . . . MEN
- 3 = 30-70% . . . MEN
- 4 = 70-95% . . . WOMEN
- 5 = 95-100% . . . WOMEN
- 9 = blank

_____ (2p) _____ (24) TRAVEL OVERNIGHT OR LONG DISTANCES.

24. Travel.

If blank, omit sentence.

- 1 = OFTEN
- 2 = SOMETIMES
- 3, 9 = blank

_____ (2p) _____ (22, 23).

22, 23. Weekend Work and Night Work. Combine the two items, with the first number Weekend Work, the second Night Work.

If blank, omit sentence.

- 11 = blank
- 12, 92 = SOMETIMES WORK NIGHTS
- 13, 93 = OFTEN WORK NIGHTS
- 12, 29 = SOMETIMES WORK WEEKENDS
- 22 = SOMETIMES WORK NIGHTS AND WEEKENDS

- 23 = SOMETIMES WORK WEEKENDS AND OFTEN WORK NIGHTS
- 31, 39 = OFTEN WORK WEEKENDS
- 32 = OFTEN WORK WEEKENDS AND SOMETIMES WORK NIGHTS
- 33 = OFTEN WORK NIGHTS AND WEEKENDS
- 99 = blank

_____ (2p) _____ (DOT 15a) WORK OUTDOORS.
DOT 15a. Working Conditions - (Indoor or Outdoors). Use the 1st column
of Working Conditions.
If blank, omit sentence.
I = blank
B = SOMETIMES
O = USUALLY

_____ (2p) _____ (20).
20. License.
If blank, omit sentence.
1 = ARE LICENSED BY THE STATE
2 = ARE SOMETIMES REQUIRED TO GET A LICENSE
3, 9 = blank

_____ (2p) _____ (21).
21. Union Membership.
If blank, omit sentence.
1 = USUALLY BELONG TO UNIONS
2, 9 = blank

_____ (2p) ARE SUBJECT TO _____ (DOT 15b) WHILE ON
THEIR JOB.
DOT 15b. Working Conditions. Use the last 6 columns only. Zero to 6
may be coded.
If blank, omit sentence.
2 = VERY COLD TEMPERATURES
3 = VERY WARM TEMPERATURES
4 = WET AND HUMID CONDITIONS

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5 = NOISE AND VIBRATIONS

6 = HAZARDS

7 = UNHEALTHY AIR

Templates

Education Data Base - College Template, Trade School Template I,
Trade School Template II

Military Data Base - Army, Navy, and Air Force Templates

Inquirer Characteristics Data Base - Newton Student Record
Template, Bigelow Student
Record Template

HGSE Placement Data File Template

EDUCATION DATA BASE
COLLEGE TEMPLATE

(Name of school) is located in (city), (state). It is (number of miles from nearest city) miles from the nearest large city, (name nearest city). Transportation to nearest city includes (transportation to nearest large city).

Founded in (year founded), (name of school) is a (control of institution) institution, (type of control), (religious affiliation). It is accredited by (accrediting agency), the regional accrediting agency, and by professional accrediting agencies. It is a (foci of school) institution, with a (least number of years in undergraduate program) to (greatest number of years in undergraduate program)-year undergraduate program. The degrees offered are at the (degrees offered) level. It has a full-time undergraduate (sex) student body, composed of (number of male full-time undergraduates) men and (number of female full-time undergraduates) women. The campus has (area of campus in number of acres) acres.

The student faculty ratio at (name of school) is (student faculty ratio) to 1. It (Phi Beta Kappa) a Phi Beta Kappa chapter. There is a library of (volumes in library in thousands) thousand volumes. The college is on a (calendar) calendar.

(Name of school) (advanced placement program) an advanced placement program. An honors program (honors program available) and an independent study program (independent study available) available.

Athletics (athletics available) available. At (name of school), there (fraternities available) fraternities and there are (sororities available) sororities available. Extracurricular activities include (specific social organizations and extracurricular activities available).

(Name of school) requires a minimum of (high school units, minimum) high school units for entrance. Required exams for admission include -- (entrance exams required). (Number of elective achievement tests required) achievement tests are required. Achievement tests are required in (achievement tests required).

The college (early decision program) an early decision plan. Freshmen (freshmen January admission) admitted in January. Normally, the application together with an application fee of \$(amount of application fee in dollars) is due on (month fall application fee deadline) (day fall application fee deadline) or (month spring application fee deadline) (day spring application fee deadline). The college (college subscribes to candidates early reply date agreement) subscribe to the candidate's reply agreement, and the applicants are notified (month acceptance of candidate notification) (day acceptance of candidate notification). Senior or comprehensive examinations (senior comprehensive or general exams) given.

Interdepartmental programs are available in (name of interdepartmental program). Preprofessional programs include (preprofessional programs available). There (undergraduate divisions besides liberal arts) other undergraduate divisions of the university including: (education undergraduate division) (engineering undergraduate division). Taking courses in other undergraduate divisions (courses in other undergraduate divisions permitted) permitted.

The candidate must accept an offer of admission by (month date candidate's acceptance of admission offer due) (day date candidate's acceptance of admission offer due). At the time of acceptance, the candidate pays (deposit required) deposit.

(Percent of class in secondary school rank)% of (number of entering freshmen) in a recent year were in the top (secondary school class rank largest % freshman class) of their high school classes.

Transfers are admitted in (month transfers admitted). A grade average of (grade average required for transfer) is required from the previous institution.

Housing is provided for (housing provided). Residence is required (residence required).

The tuition at (name of school) is (resident tuition per year in dollars) for state residents and (non resident tuition per year in dollars) for non residents. (Average room and board per year in dollars) is the average cost of room and board in the dorms for a year. Fees other than lab fees amount to \$(other fees per year in dollars). The total estimated

cost, not including personal expenses and lab fees, is \$(total cost per year in dollars).

(Student aid percent of students)% of students receive some kind of financial aid at (name of school). National Defense Education Act (NDEA) loans are (NDEA loans) available. In a recent year (loans granted, total number of) loans totaling (total amount of loans granted) from various sources were granted. The largest loan was for \$(highest loan granted). The average freshman loan was \$(freshman loans granted, average amount of).

In a recent year, a total of (total number of scholarships granted) scholarships, ranging from \$(lowest amount of scholarship in dollars) to (highest amount of scholarship in dollars) dollars, a total of (total amount of scholarships in dollars) dollars, were granted. There were (number of freshman scholarships) freshmen scholarships, averaging (average amount of freshman scholarships) dollars. The college does (college scholarship service participant) participate in the college scholarship service. The deadline for filing applications for financial aid is (month application deadline for scholarship) (day application deadline for scholarship).

(Percent students working)% of the students work to help with their expenses. (Name of school) is (federal work-study program participant) a federal work-study participant.

(Name of school) (summer session available) a summer session. The college has (special facilities available). Other special programs include -- (other special programs). (Specific ROTC available) ROTC is available. Physical education (physical education required) required. The guidance facilities at (name of school) are listed here -- (specific guidance facilities available).

For further information contact (person to contact for further information) (title of person to contact for further information) (street address of person to be contacted for further information) (zip code of person to be contacted for further information).

TRADE SCHOOL FILE
TEMPLATE I

(Record name), a (private or public), (profit or non-profit), (religious affiliation), (student body composition) institution established in (year established), is located at (address). Preparing students for a career in (focus of school), the school offers a (duration of program) program leading to a (type of degree). It is (accreditation) by the (accreditation body).

(Subjects or majors) are (specific subjects/fields). On-the-job training (on-the-job training) a part of the program. To graduate, (units for graduation) (specification of units) are required, a credit hour being (credit hour definition) hours of instruction. A joint study program with (college or j.c. affiliation) enables students to enroll for courses leading to a (type of degree). For further information, refer to the (college or j.c. affiliation) description in the (data base) Data Base. (Other programs) are available.

The school (placement office) a placement office for its students. The basic entrance and application requirements of (record name) are:

- You must (education requirement) and have taken (h.s. subjects).
- You should be (age requirement) years old.
- You need to submit (other entrance requirements) and (number of recommendations) letters of recommendation.

A personal interview is (interview). An application fee of \$ (application fee) should accompany the application. A (refundable or non-refundable) (other fee) fee of \$(amount of fee) must be submitted (fee due date). Students may apply for classes which begin (enrollment dates).

Total expenses for (expense coverage) are approximately \$(total cost). This includes tuition of \$(tuition) (credit hour), (room and board) fees of \$(room and board fees), textbooks, \$(textbook expenses), (uniforms), (other costs), \$(other cost total), and (other costs), \$(other cost total). Out of state residents must pay an additional \$(non-resident tuition) for tuition.

Dormitory facilities (availability of dorm facilities) provided for (dormitory residents). (Housing stipulations). (Number of scholarships) (type of scholarship) scholarships are awarded (frequency of awarding) on the basis of (basis for awarding). Loans of (amounts of loan) (loan availability) from (loan program titles).

(Record name) has approximately (student body size) students and (faculty size) faculty members. Extracurricular activities include (extracurricular activities).

For further information, contact (contact person).

EDUCATION DATA BASE
TRADE SCHOOL TEMPLATE II

(Record name), a (duration of program) college located at (address), offers (other programs) for students who do not wish to enroll in the degree program. The school, a (private or public), (profit or non-profit), (religious affiliation), (student body composition) institution established in (year established), specializes in (focus of school). It is (accreditation) by the (accreditation body).

To enroll, you need to (special program requirements). Some of the courses offered are (specific subjects/fields). Classes begin (enrollment dates). A certificate is issued to each student who completes one or more courses. Subjects taken can be applied for degree programs at the college.

There is a tuition charge of (tuition) per course (state resident or not). (Other costs) are additional expenses.

For further information, contact (contact person).

MILITARY DATA BASE
ARMY TEMPLATE

In the Army, (Army general descriptions).

A (record name) must have (mental requirements - Army). He also must have (physical requirements - Army).

School courses in (high school courses) are helpful. Experience involving (prior experience) is valuable.

*Some specialized jobs for the (record name) are the following: (specialized Army jobs).

At the present time, there is (personnel requirements - Army). However, this may not apply for a particular specialty.

From on-the-job training experience or attendance at a technical school, an Army man in one or more specialties may gain knowledge of (knowledge and skills gained - Army).

Related areas of service in the Navy are (record name); in the Air Force, (record name); and in civilian life, (related civilian jobs - Army).

(Availability for women).

* If a single item, substitute this statement.

A (record name) may hold the specialized job of a (specialized Army jobs).

MILITARY DATA BASE
NAVY TEMPLATE

In the Navy, (Navy general descriptions). He serves (place of work).

A (record name) must have (abilities, aptitudes, traits - Navy, Air Force). School courses in (high school courses) are helpful. Experience involving (prior experience) is valuable.

He becomes a (record name) through (service schools - Navy), covering such topics as (areas of study - Navy).

(Navy specialties) are specialties within the Navy of a (record name).

Related areas of service in the Army are (record name); in the Air Force, (record name); and in civilian life, (related civilian jobs - Navy).

(Availability for women).

Chart number (chart number for Navy list) in the U.S. Navy Enlisted Occupations Handbook has further information on this and other Navy occupations.

MILITARY DATA BASE
AIR FORCE TEMPLATE

In the Air Force, (Air Force general descriptions). He serves (place of work).

A (record name) must have (abilities, aptitudes, traits - Navy, Air Force). School courses in (high school courses) are helpful.

*Some specialized jobs for the (record name) are the following: (specialized Air Force jobs).

From on-the-job training experience or attendance at a technical school, an airman in one or more specialties may gain knowledge of (knowledge and skills gained - Air Force).

Related areas of service in the Army are (record name); in the Navy, (record name); and in civilian life, (related civilian jobs - Air Force).

(Availability for women).

* If single item, substitute this statement.

A (record name) may hold the specialized job of a (specialized Air Force jobs).

INQUIRER CHARACTERISTICS DATA BASE
NEWTON STUDENT RECORD TEMPLATE

As a sophomore at Newton, you took these courses and received the following grades and credits:

<u>Number of Credits</u>	<u>Grade</u>	<u>Course</u>
<u>(1 credit 1st year course)</u>	<u>(1 grade 1st year course)</u>	<u>(1 number 1st year course)</u>
<u>(2 credit 1st year course)</u>	<u>(2 grade 1st year course)</u>	<u>(2 number 1st year course)</u>
<u>(3 credit 1st year course)</u>	<u>(3 grade 1st year course)</u>	<u>(3 number 1st year course)</u>
<u>(4 credit 1st year course)</u>	<u>(4 grade 1st year course)</u>	<u>(4 number 1st year course)</u>
<u>(5 credit 1st year course)</u>	<u>(5 grade 1st year course)</u>	<u>(5 number 1st year course)</u>
<u>(6 credit 1st year course)</u>	<u>(6 grade 1st year course)</u>	<u>(6 number 1st year course)</u>
<u>(7 credit 1st year course)</u>	<u>(7 grade 1st year course)</u>	<u>(7 number 1st year course)</u>

(total first year credits) Total credits for Sophomore year.

Here is the record of your junior year.

<u>Number of Credits</u>	<u>Grade</u>	<u>Course</u>
<u>(1 credit 2nd year course)</u>	<u>(1 grade 2nd year course)</u>	<u>(1 number 2nd year course)</u>
<u>(2 credit 2nd year course)</u>	<u>(2 grade 2nd year course)</u>	<u>(2 number 2nd year course)</u>
<u>(3 credit 2nd year course)</u>	<u>(3 grade 2nd year course)</u>	<u>(3 number 2nd year course)</u>
<u>(4 credit 2nd year course)</u>	<u>(4 grade 2nd year course)</u>	<u>(4 number 2nd year course)</u>
<u>(5 credit 2nd year course)</u>	<u>(5 grade 2nd year course)</u>	<u>(5 number 2nd year course)</u>
<u>(6 credit 2nd year course)</u>	<u>(6 grade 2nd year course)</u>	<u>(6 number 2nd year course)</u>
<u>(7 credit 2nd year course)</u>	<u>(7 grade 2nd year course)</u>	<u>(7 number 2nd year course)</u>
<u>(8 credit 2nd year course)</u>	<u>(8 grade 2nd year course)</u>	<u>(8 number 2nd year course)</u>

You earned a total of (total second year credits) credits for both your sophomore and junior years.

These are the courses that you took as a senior.

<u>Number of Credits</u>	<u>Grade</u>	<u>Course</u>
<u>(1 credit 3rd year course)</u>	<u>(1 grade 3rd year course)</u>	<u>(1 number 3rd year course)</u>
<u>(2 credit 3rd year course)</u>	<u>(2 grade 3rd year course)</u>	<u>(2 number 3rd year course)</u>
<u>(3 credit 3rd year course)</u>	<u>(3 grade 3rd year course)</u>	<u>(3 number 3rd year course)</u>
<u>(4 credit 3rd year course)</u>	<u>(4 grade 3rd year course)</u>	<u>(4 number 3rd year course)</u>
<u>(5 credit 3rd year course)</u>	<u>(5 grade 3rd year course)</u>	<u>(5 number 3rd year course)</u>
<u>(6 credit 3rd year course)</u>	<u>(6 grade 3rd year course)</u>	<u>(6 number 3rd year course)</u>
<u>(7 credit 3rd year course)</u>	<u>(7 grade 3rd year course)</u>	<u>(7 number 3rd year course)</u>
<u>(8 credit 3rd year course)</u>	<u>(8 grade 3rd year course)</u>	<u>(8 number 3rd year course)</u>

For all three years of your high school work, you earned a total of (total third year credits) credits.

INQUIRER CHARACTERISTICS (NEWTON STUDENTS) DATA BASE
BIGELOW STUDENT RECORD TEMPLATE

As a seventh grader at Bigelow, you received the following grades: English (7 English Yearly Marks), Social Studies (7 Social Studies Yearly Marks), Math (7 Math Yearly Marks), Science (7 Science Yearly Marks), French (7 French Yearly Marks). In the eighth grade you received these grades: English (8 English Yearly Marks), Social Studies (8 Social Studies Yearly Marks), (Eighth Grade Math), Math (8 Math Yearly Marks), Science (8 Science Yearly Marks), French (8 French Yearly Marks). The following were your ninth grade fourth quarterly marks: English (4 English Ninth Term Marks), Social Studies (4 Social Studies Ninth Term Marks), (Ninth Grade Math), (4 Math Ninth Term Marks), Science (4 Science Ninth Term Marks), (Ninth Grade Elective), (4 Elective Ninth Term Marks).

You have taken ability and achievement tests throughout your school years. You will now get a summary of your test scores. These percentile scores will show how you ranked with other students in the same grade throughout the entire nation.

You took the Otis Ability Test in the 8th grade, scoring in the (8 Na Pr Otis)th percentile. On the STEP achievement tests, which were taken during the same year, you ranked in the (8 Na Pr Reading Step Scores)th percentile in reading and in the (8 Na Pr Math Step Scores)th percentile in Math.

Here are the results of the Kuhlmann-Anderson ability tests that you took in elementary school: sixth grade, (6 Na Pr Kuhlmann-Anderson) percentile; third grade, (3 Na Pr Kuhlmann-Anderson) percentile. On the sixth grade STEP achievement tests you scored in Reading in the (6 Na Pr Reading Step Score)th percentile, Math in the (6 Na Pr Math Step Score)th percentile, Science in the (6 Na Pr Science Step Score)th percentile, Social Studies in the (6 Na Pr Social Studies Step Score)th percentile, and Writing in the (6 Na Pr Writing Step Score)th percentile.

In the major subjects of the sixth grade, you were ranked (6 Reading Ratings) in Reading, (6 Expression Ratings) in Expression, (6 Spelling

Ratings) in Spelling, (6 Handwriting Ratings) in Handwriting, (6 Arithmetic Ratings) in Arithmetic, (6 Social Studies Ratings) in Social Studies, (6 Science Ratings) in Science, and (6 Study Skills Ratings) in Study Skills.

Regarding your future vocational plans, in the 7th grade you said that you were interested in (DOT code).

HGSE PLACEMENT DATA BASE
TEMPLATE

(Name of employer) in (city or town), (state or foreign country) has a (month vacancy opens) (day vacancy opens), (year vacancy opens) opening for a (position title) of (field 1) and (field 2). The salary offered ranges from (yearly salary) to (top of salary range), (other salary specification). In addition, (summer school percent of yearly salary)% of the school year salary can be earned for summer school work.

The lowest grade level involved is (lowest grade level); the highest, (highest grade level). The employer desires (teaching experience) years of experience in teaching and/or (administrative experience) years' experience in administration or (experience desired) years' experience in fields other than teaching and administration is desired. (Minimum education required).

The normal teaching load is about (normal teaching hours) hours per week. (Certification required). Fringe benefits include (1 benefits), (2 benefits), (3 benefits), and (4 benefits).

For further information, write to: (contact person)

(title of contact person)

(name of employer)

(address of contact person)

(city or town), (state or foreign country)

(zip code)

APPENDIX C

HF Cards

Specifications of Decode Tables

Keypunching of Scripts

CRD Card Format and Card Scan Conventions

HASM Tables

Header Card for Descriptor Information

<u>Columns</u>	
1	Card identifier - H
2-3	Length of data base name
4-N	Name of data base (i.e., Military)
N+1-N+2	Length of sub-file name
N+3-M	Name of sub-file (i.e., Army)
M+1-M+2	Ordinal number of field on card which serves as record identifier on file.
M+3-M+5	Number of fields described

Format for Descriptor Cards

<u>Column(s)</u>		
A.	1	Card Identifier - F
B.	2	Ø;1 if no more cards in descriptor.
C.	3-4	Number of characters (N) in Field Name
D.	5-M(M=5+N)	Field Name
E.	M+1-M+3	Column data begins - 4 cols.
F.	M+4-M+6	Number of columns it occupies*
G.	M+7-M+8	Number of allowable input values* (ØØ-99 counts as 1 here) A Ø here indicates that any alphameric input is acceptable. In this case, Field J below will be understood to begin at M+11.
H.	M+9-M+1Ø	Number of recode values*
I.	M+11-X	String of allowable input values For ØØ-99, put on card, ##. For ØØØ-999 ###, etc.
J.	X+1-X+2	Byte length of recode values. ΔΔ if variable length text; Ø if no recode. BL to remove blanks. BI for character binary.
K.	X+3-Z	String of recode values. If variable-length text, a 3-character byte count must precede each. Must be in same order as allowable field they are to replace. If text strings replace various values of ###, they must be in ascending numerical order.

* Numbers should be right-justified with preceding zeros.

M E M O R A N D U M

April 23, 1968

TO: Computer Area
FROM: Roy Norris
SUBJECT: Decode Table Card Deck

1.0 The following cards should be keypunched according to CRD card format described elsewhere. Delimiters should be punched between each field: non before field 1.

2.0 Card 1:
Field 1: FILE
Field 2: _____ name of file

3.0 Card 2:
Field 1: DECODEΔTABLE
Field 2: _____ name of table "\$XX..."

4.0 Card 3:
Field 1: COUNT
Field 2: _____ (Rough count of bytes required for table divided by 70)

5.0 Card 4:
Field 1: H
Field 2: Table Code Type (Integer 1, 2, or 3) (see 8.0).
Field 3: Width of code field for any appearance of a code within the table.
Field 4: Lowest code appearing in table.
Field 5: Highest code appearing in table.

- 6.0 Card 1:
Field 1: E
Field 2: Code for field 3 (characters for type 2 code,
decimal integer otherwise).
Field 3: Text indicated by code in field 2.
Field 4: Text indicated by code in field 2 incremented by
one; if code type is 1 or 3.
Field 5: etc.
etc. etc.
- 7.0 Last card:
Field 1: ENDR
- 8.0 Table Code Types:
Code type 1 indicates that all codes within the table are integers;
and that within the range between lowest and highest codes used
in the table there are few, if any, unused codes.
Code type 2 indicates that all codes within the table are character
strings.
Code type 3 indicates that all codes within the table are integers
and that within the range between lowest and highest codes used in
the table there are many unused codes.

MEMORANDUM

April 25, 1968

TO: Computer Area
FROM: Roy Norris
SUBJECT: Keypunching Scripts

1.0 Scripts should be keypunched according to CRD card format described elsewhere. Delimiters should be punched between each field, none before field 1.

1.1 A delimiter which will apply generally for all cards to follow, should be specified (via columns 2 and 3) on the "RECORD" card. Whenever the delimiter needs to be respecified for one or more exceptional cards, it should be reset on a following card as originally per columns 2 and 3 on the "RECORD" card.
EXAMPLE:

	AD;RECORD;EXPLORE	
column	00000	1
	12345	7

1.2 Semi-colon is suggested for general use as a delimiter.

1.3 The at symbol, @, is suggested for use as a rubout character.

1.4 Whenever a line of data bytes overflows from card A onto a continuation card, the break in the line will occur just after the rightmost non-blank character on card A. If the first character following the break is a blank, it is necessary to precede it on the continuation card by a rubout character.

1.41 EXAMPLES:

The line: ManyΔpeopleΔwatchedΔtheΔgame.

CARD J:

	ΔR@
column	000
	123

CARD A:

	ΔΔΔΔ...MANYΔPEOPLEΔWATCHEDΔ	
column	0000	77
	1234	12

CARD B:

	BΔΔ@ΔTHEΔGAME.	
column	000000	11
	123456	34

The line breaks after the letter, D. (The data overflow column in this case is column 71.) Since a blank follows the break, the rubout character is punched in column 4 of the continuation card, forcing column 4 to be the data continue column. The blank in column 5 of card B, is therefore taken as the first data byte on card B and follows directly after the D in column 71 on card A.

- 1.42 An alternate way of breaking the line would be to break it after the letter, H, in column 69 as below.

CARD A:

	ΔΔΔΔ...MANYΔPEOPLEΔWATCHΔΔΔ	
column	0000	6777
	1234	9012

CARD B:

	BΔΔEDΔTHEΔGAME.	
column	000000	11
	123456	45

- 1.5 Please note that the readability of the card deck may be improved if a few columns directly after column 3 on continuation cards are left blank. (Blanks between column 3 and the first following non-blank are ignored.)

CARD A:

	ΔΔΔD;009.00;CRTΔΔLASTΔNIGHT...
column	000000000011
	12345678901

CARD B:

column BAAAAAAAAAEDATHEGAME.
0000000011
12345678901

CARD A: D;009.00;CRT LAST NIGHT...
CARD B: B ED THE GAME.

- 2.0 CARD 1:
Field 1: FILE
Field 2: SCRIPTS (filename)
- 3.0 Card 2:
Field 1: RECORD
Field 2: EXPLORE (record name is, script name)
- 4.0 Card 3:
Field 1: COUNT
Field 2: (rough count of cards before next ENDR card.) see 4.1
- 4.1 Presence of this card indicates that continuation records are desired and that first-linked descriptor of each DASM record will contain a table of contents for the first record and all its continuation records. (see HASM \$\$ table.)
- 5.0 Card 1:
Field 1: D
Field 2: (Step Name)
Field 3: (Step Text)
- 6.0 Last Card
Field 1: ENDR
- 7.0 Comment cards may precede any non-continuation card. Comment cards have an asterisk in column one. Comment cards will be written directly to SYSLST but otherwise ignored when the script is processed into DASM record and descriptor formats.

M E M O R A N D U M

July 15, 1968

TO: Computer Area
FROM: Roy Norris
SUBJECT: CRD Card Format and Card Scan Conventions

- 1.0 The CRD card format facilitates the recording and subsequent reading from cards of data where:
- 1.01 1. Any valid 12-bit Extended Hollerith Card Code is likely to occur as part of the data and cannot be used exclusively as a rubout character or as a delimiter to the scanning of the card;
 - 1.02 2. it is desirable to allow the data to overflow from one card onto continuation cards;
 - 1.03 3. it is desirable to be able to strike out data from a continuation card without rekeypunching the adjacent cards and without having to shift data to the right or left on any card;
 - 1.04 4. it is desirable to be able to expand data on a continuation card without rekeypunching the adjacent cards and without having to shift data to the right or left on any card.
- 1.1 The CRD card format allows one:
- 1.11 1. to assign rubout and delimiter codes locally to any card or any groups of cards within a deck;
 - 1.12 2. to specify any Hollerith code (except B) as the rubout code, or the delimiter code;
 - 1.13 3. to deallocate all Hollerith codes from interpretation as the rubout code, or the delimiter code, or both;
 - 1.14 4. to insert new data between any two columns of data within the deck; (see 5.0)
 - 1.15 5. to specify that consecutive occurrences of the delimiter are or are not (optionally) to be interpreted as a single occurrence.

- 1.2 Several concepts are crucial to the CRD card format.
- 1.21 Data String
A data string consists of one or more data sub-strings or data segments.
- 1.22 Data Segment
A data segment consists of zero or more bytes of data. (The number of bytes in a segment may exceed 80.)
- 1.23 Card Image
A card image is simply the 80 consecutive EBCDIC bytes equivalent of an 80 column card punched in Extended Hollerith Card Code; regardless of whether the EBCDIC bytes are in core or magnetic tape, or otherwise.
The term "card image" should be read for "card" except in instances of card keypunching, duplication, etc.
- 1.24 Card Set
A card set consists of one or more cards; as many as are required to record a particular data string.
- 1.25 Control Columns
Columns 1, 2, and 3 of a card are control columns; used to alter the CRD scan algorithm as applied to columns 4 through 72 of this card and of succeeding cards.
- 1.26 Excess Columns
Consecutive columns of blanks adjacent to and inside of either columns 3 and/or 73.
- 1.27 Data Columns
Card columns left after excluding: control columns, excess columns, columns with delimiters, columns with rubouts, and columns 73 through 80.
- 1.28 Data String Continuity
The data columns within a card set while not physically contiguous are nonetheless logically contiguous. The data bytes borne by these data columns represent a continuous data string, less any explicit delimitation of data segments.
- 2.0 CRD Card Format
- 2.1 Card Types
There are several types of cards; each type distinguished primarily by the contents of column 1.
- 2.11 Data Begin Card
Column 1 is blank and there is at least one non-blank in columns four (4) through 72. The first non-blank column on this card is the data begin column. The data begin card begins a card set.

- 2.12 Continuation Card
Column one is a continue code. If columns 4 through 72 are blank these columns are ignored. Otherwise, the first non-blank column after column 3 and before column 73 is the data continue column and continues the data string from the preceding card. Adjacent continuation cards should have continue codes that are equal or in ascending collating sequence.
Sequence fault will cause an advisory diagnostic along with card image to be listed on print output. Card will be accepted. A fault signal is returned. Columns 2 and 3 are effective unless continuation card does not continue a preceding card; in which case the entire card is listed as bad on the print output.
- 2.13 End-of-Deck Signal Card
Column one is the percent -- a card flag. This card may be used to signal the end of a logical deck of zero or more card sets. It does begin a card set, itself, but will cause a current card set to be terminated. Card is listed on print output. Columns 2-72 are ignored, other than being listed.
- 2.14 * - Comment Card
Column one is an asterisk -- a card flag. This card may be used to enter comment directly onto the print output. It does not begin a card set, but will cause a current card set to be terminated. Card is listed on print output. Columns 2-72 are ignored, other than being listed.
- 2.15 Blank Card
Column one is either blank or a continue code, and columns 4 through 72 are blank. (see 2.12 - Continuation Card.) If column one is blank, columns 2 and 3 are always effective. Useful for altering the delimiter or rubout assignment.
- 2.16 Non-Continuation Card
Column one is any code other than a continue code. Card sets must be terminated by a non-continuation card; such as the data begin card if the next card set, or an end of deck signal card.
- 2.2 There are four columns of special import. These columns may or may not also be data columns; they may bear delimiters and/or rubouts. They are:
- 2.21 Data Begin Column
The first non-blank column to the right of column 3 on the data begin card is the data begin column;
- 2.22 Data End Column
The last non-blank column to the left of column 73 on the last card of a card set is the data end column;

- 2.23 Data Overflow Column
The last non-blank column to the left of column 73 on a card within a card set but excluding the last card is a data overflow column;
- 2.24 Data Continue Column
The first non-blank column to the right of column 3 on a card within a card set but excluding the first card is a data continue column.
- 2.3 Control Flags and Codes
Various control flags and control codes may be used in the control columns to modify the method of picking up and assembling bytes from data columns.
- 2.31 Continue Codes
Used in column one. (see 2.12.) Any Extended Hollerith code except a non-continue code.
- 2.32 Non-Continue Codes
Used in column one. (see 2.1)
- 2.321 A blank signifies either a blank card or a data begin card.
- 2.322 An (*) asterisk signifies a comment card.
- 2.323 A (%) percent signifies an end-of-deck signal card.
- 2.33 Mode Flags
Used in column 2.

- 1.0 For each data file there will be a record whose name is

\$X...XΔTBL

where X...X is replaced by the name of the file, file name being one to 8 characters long or truncated to 8 if longer. The record named \$MILITARYΔTBL will contain tables describing the format of multiple-field value strings and/or the interpretation of coded values for the file named MILITARY. The \$FMTBL table precedes the \$DSTBL table within this record.

2.0 TABLE FORMATS - General

Tables are carried character for character as value strings of descriptors. The names of such descriptors begin with a dollar sign, \$. Under time-sharing, these tables are used directly in the input area. Most two byte table elements are half-word aligned (H.W.A.). (Exceptions occur within decode tables.) Relative addresses (RADs) within a table never exceed 2K. Long tables are segmented to less than 2K per segment.

- 2.1 A table may exist in several segments, each segment being stored under a different record name. Each segment consists of:

1. a segment header beginning with byte 1 of the value string and half-word aligned;
2. a segment body; and
3. a segment trailer.

2.2 LINKED ENTRIES

The body of a segment may consist of linked table entries, where each entry is headed by a link address half-word containing the relative address (RAD) of a similar link address half-word of a successive entry. The last such entry links to the segment trailer. The first half-word of the segment header links to the first-linked entry.

- 2.21 Linked entry format is used for the \$DSTBL table and the \$FMTBL table.

2.3 STACKED ENTRIES

The body of a segment may consist of one link address half-word followed by several stacked table entries. The link address contains the RAD of the segment trailer. In general, each stacked entry consists of:

1. a code field of t bytes;
2. a one-byte binary count -Cg; and
3. Cg bytes of display text.

The value t is constant throughout a segment and is carried in the segment header. The first half-word of the segment header links to segment body.

- 2.31 Stacked entry format is used for decode tables.
- 2.4 All link addresses within a segment are relative to byte one of the segment header, and are even.
- 2.5 Several table segments may be linked by storing the base (absolute) address of the segment header of the successive segment into each segment trailer just prior to use.
- 2.51 N.B. The EDAs (in MBTS login area) for the half-pages containing table segments linked as above should be flagged such that:
1. the half-pages are not considered to have been altered and therefore are not swapped out at the end of the time slice; and
 2. each half-page is refreshed from the original disc copy on the next time slice for same user.

2.6 TABLE SEGMENT TRAILER (TST)

<u>No. of bytes</u>	<u>Elements, in order</u>
2	zero (half-word aligned)
4	zero (used to hold the base address of table continuation)
1	reserved
1	record name count - Cc. (forced even). Cc=0 if table not continued. Cc=2 is HASM record continuation suffix given.
Cc	record name or continuation suffix of record bearing continuation of this table. Absent if table not continued.

3.0 \$DSTBL TABLE

3.1 The descriptor \$DSTBL will contain the \$DSTBL table with entries for:

1. any "target" field occurring as a fixed-position sub-string within the value string of a differently named descriptor, coded or non-coded;
2. any "target" descriptor whose value string consists of one or more coded sub-strings (each of width w) representing one or multiple values of the descriptor, coded or non-coded;
3. any "target" descriptor bearing a value which is a code to be used to obtain displayable text from a decode table. (See also code types under 3.31 Flag byte)

In brief, any descriptor whose value string does not consist of a single immediately displayable character text requires one or more entries in the \$DSTBL table. Exceptions to this are descriptors whose value strings bear data used internally within TSIM but not intended for immediate display at a user terminal.

3.2 \$DSTBL table segment header format is:

<u>No. of bytes</u>	<u>Elements in order</u>
2	Half-word RAD of first linked entry of this segment
1	Sequence number of current segment
1	Total number of segments of this table

3.3 \$DSTBL table body is in linked entry format. Each entry has format:

<u>No. of bytes</u>	<u>Elements in order</u>
2	RAD of next entry, H.W.A.
1	Reserved byte
1	Flag byte
2	TET (Table Entry Tag) of an entry in \$FMTBL, if target field <u>is</u> formatted as <u>one</u> field within a non-target descriptor; or zero (null).
2	Field index j (if TET > 0); or field width w (if TET = 0); or zero (if TET = 0)
1	Target name count -- Cn. (Cn is odd.)
Cn	Target descriptor name or target field name

<u>No. of bytes (con'd)</u>	<u>Elements in order (con'd)</u>
1	Decode table name count -- Cd. (Cd is odd.) Cd = $\emptyset$ is no decode table for target.
Cd	Decode table name. (Absent if Cd = $\emptyset$)
1	Record name count -- Cr. (forced even) If Cr = $\emptyset$ and Cd $\neq \emptyset$, then record name is to be derived from decode table name by the removal of a padding character, if possible, or by the additions of one padding character. Cr = $\emptyset$, if Cd = $\emptyset$
Cr	Record name. Name of record that contains indicated decode table. Absent if Cr = $\emptyset$.

3.31

FLAG BYTES

Bits $2^7 - 2^6$ are always zero, but are available for use as scratch flags by programs like Disc Loader. Bits $2^1 - 2^0$ indicate the code type of the target descriptor or target field.

<u>bits $2^1 - 2^0$</u>	<u>code type</u>
$\emptyset$	(Not applicable)
1	<u>Binary positional flags.</u> Value string of target descriptor consists of bit flags. <u>Bit flags</u> are numbered from one to n counting left (high order) to right (low order), when they occur in code type 1 value strings. Each bit flag indicates a binary value: bit k representing binary value k.
2	<u>Character</u> Target field <u>or</u> value string of target descriptor consists of characters.
3	<u>Binary</u> Target field <u>or</u> value string of target descriptor is a binary value.

3.32

TARGET DESCRIPTOR

A target descriptor is a descriptor whose name is that by which the value(s) is generally known, (i.e., the name is used to fetch the value). The value string of the simplest target descriptor bears a single value. More complex target descriptors have multiple-field value strings bearing several values of similar type. These values may be coded, requiring decoding via a decode table.

3.33 NON-TARGET DESCRIPTOR

A non-target descriptor is a descriptor whose name is not that by which the value(s) is generally known. The value string is generally a multiple-field value string bearing a number of values of dissimilar types, and known (retrievable) by different names. Each value may or may not be coded.

3.34 TARGET FIELD

A target field is a field that occurs within the multiple-field value string of a non-target descriptor. A target field bears a value which is known (retrievable) by a name that is different than that of the descriptor. The value may be coded.

3.35 TET (Table Entry Tag)

A cross-reference to an entry in the \$FMTBL table. Zero (binary) means there is no TET reference. A TET > 0 is required for a target field entry.

3.36 FIELD INDEX - j

Indicates ordinal number of a target field within a multiple-field value string. j > 0 required for a target field entry.

3.37 FIELD WIDTH - w

Field width, w > 0, indicates that target descriptor has a multiple-field value string. Each field does not exceed w bytes.

3.371 CONCATENATE WITH SEPARATORS (CS) CONVENTION

If code type is character and first byte of the value string is a comma, then each field may be zero to w characters long and each field is preceded by a comma. Use of the comma in this manner will in general consume disc storage unnecessarily, and should be reserved for those instances where it gives significant benefits. Consecutive commas indicate a null field. Commas may not occur as a character within a field.

3.372 CONCATENATE BY CONSTANT FIELD WIDTH (CC) CONVENTION

If code type is character and first byte of value string is not a comma, then each field is of constant width w bytes and is not explicitly separated from succeeding fields.

3.373 If code type is other than character, each field is of constant width w bytes and is not explicitly separated from succeeding fields.

3.38 DECODE TABLE NAME

If decode table name count is non-zero, then there is a decode table for the target descriptor or field. The table is stored in a descriptor of the same name as the decode table. The first character of the name is a dollar sign, \$. The table is stored under a record name which is identical with the decode table name, unless a different name is given under record name; 3.39. (The name of the record would actually differ by one null padding character.) Decode table name is absent if no decode table for target.

3.381 Names for decode tables should be kept as short as possible, e.g., \$LQ, or \$L108.

3.39 DECODE TABLE RECORD NAME

If record name count is non-zero, then the record name under which the decode table is stored is explicitly given and not assumed to be derivable from the decode table name. (see 3.38.) If record name count is zero, then record name is absent (of zero byte length).

4.0 \$FMTBL TABLE

4.1 The descriptor \$FMTBL will contain a table with an entry for every non-target descriptor. (see 3.33)

4.2 \$FMTBL table segment header format is:

<u>No. of bytes</u>	<u>Elements in order</u>
2	Half-word RAD of first linked entry of this segment
1	Sequence number of current segment
1	Total number of segments of this table
2	Highest TET (Table Entry Tag) yet assigned. Zero indicates that table is empty.

4.3 \$FMTBL table body is in linked entry format. Each entry has format:

<u>No. of bytes</u>	<u>Elements in order</u>
2	Half-word RAD of next entry
1	Reserved byte

No. of bytes (con'd) Elements in order (con'd)

1	Flag byte
2	<u>Table Entry Tag (TET)</u> of this entry. (Binary integer > 0)
1	<u>Non-target descriptor name count</u> - C _n . (C _n is odd.)
C _n	<u>Non-target descriptor name</u>
1	Format string count - C _f . (C _f is even.)
C _f	Format string (see below)

4.31 The format string consists of one or more pairs of binary quantities r and w, one byte per quantity. Quantity w is a field width. Quantity r (where $r \geq 1$) indicates that a w-byte field occurs r-times in succession.

4.32 FLAG BYTE

Currently contains binary zero.

4.33 TABLE ENTRY TAG - TET

A positive non-zero integer assigned uniquely to each entry in the \$FMTBL table. Used to reference an entry in the \$FMTBL table. The highest TET currently assigned is kept in the segment header.

5.0 DECODE TABLES

5.1 For every value string or sub-string that requires decoding into some displayable text, there must exist a decode table. Reference to a decode table is made via the \$DSTBL table by HASM. HASM will use decode table \$L3 for interpreting a value of a target descriptor or target field described by an entry in table \$DSTBL, if that entry indicated this particular decode table.

5.2 Decode table segment header format is:

<u>No. of bytes</u>	<u>Elements in order</u>
2	Half-word RAD of segment body of stacked entries
1	Sequence number of current segment
1	Total number of segments of this table

<u>No. of bytes (con'd)</u>	<u>Elements in order (con'd)</u>
1	Reserved byte
1	Flag byte (contains table code types)
1	Width of code fields as they occur within this table segment - t (t is byte width)
t	Highest code occurring in last segment
t	Lowest code occurring in first segment
t	Lowest code occurring in second segment, if any
etc.	etc.

5.21

FLAG BYTE

Bits $2^7 - 2^6$ are always zero, but are available for use as scratch flags by programs such as Disc Loader. Bits $2^1 - 2^0$ indicate the code type of codes as stored within this table.

<u>BITS $2^1 - 2^0$</u>	<u>TABLE CODE TYPE</u>
0	(Not applicable)
1	<u>BINARY AND POSITIONAL</u> Codes are binary integers right adjusted within fields of t-bytes width, within segment header. Codes are not <u>still</u> explicitly within the segment body. Each stacked entry consists only of a text count and a text string. The code value for the first stacked entry within a segment is the lowest code occurring within that segment, and is obtained from the segment header. Each successive stacked entry has an implied code value one higher than that of the preceding entry.
2	<u>CHARACTER</u> Codes are character strings, left-adjusted and <u>null</u> padded within fields of t-bytes width, throughout this table segment.
3	<u>BINARY</u> Codes are binary integers right-adjusted within fields of t-bytes width throughout this table segment.

- 5.3 Decode table body is in stacked entry format
- 5.31 First two bytes (H.W.A.) of table body contain RAD of segment trailer. This is followed by one or more stacked entries.

- 5.32 Each stacked entry has format:

<u>No. of bytes</u>	<u>Elements in order</u>
s	Code for this entry if table code type is 2 or 3; otherwise code element is absent (i.e., $s = \emptyset$) $s = t$ if table code type is 2 or 3.
1	Text count - C_g
C_g	Displayable text corresponding to code

5.4 Usage of Table Code Types

- 5.41 Table code type 1 should be used whenever all codes are integers and within the range between lowest and highest codes used within a table there are few if any gaps of unused codes.
- 5.42 Table code type 2 should be used whenever the codes are character strings.
- 5.43 Table code type 3 should be used whenever all codes are integers and within the range between lowest and highest codes used within a table there are many gaps of unused codes.

APPENDIX D

Computer Operators Guide to ISVD Programs

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Card to Tape Script Loader (CTSL)
and direct data loader

CTSL reads in the scripts which are punched in cards and constructs the required number of records in the proper form to be written to the disc packs and later accessed by TSIM. CTSL also diagnoses many types of script errors allowing the operator to reject bad scripts and printing error messages so that the scripts errors can be corrected.

INPUT

The only input to CTSL is punched cards for the scripts and CTSL control cards.

OTHER EQUIPMENT

1. A Reader.
2. A Printer.
3. An ISVD tape for CTSL output.
4. A scratch tape.
5. The ISVD Program Load Library.

SET UP

1. Place the CTSL cards and scripts cards in the card reader (e.g. R1).
2. Ready a printer (e.g. L1).
3. Mount the ISVD Program Load Library, ring out, on a tape drive (e.g. Ø6).
4. Mount the CTSL output tape, ring in, on a tape drive (e.g. Ø3).
5. Mount the scratch tape, ring in, on a tape drive (e.g. Ø4).

OPERATIONS (per example)

1. Operator type in, "EALODACTSL,Ø6,,R1"
2. Machine type out, "YACTSLΔΔΔØ11GΔΔASSGNΔCARDRD"
Operator response, "YΔR1"
3. Machine type out, "YACTSLΔΔΔØ11GΔΔASSGNΔSCNPNT"
Operator response, "YΔL1"
4. Machine type out, "6ACTSLΔΔΔΔPLEASEΔMOUNTAREELA
SCRIPTSΔΔΔFORΔASMAFILEΔΔSCRIPTSΔΔΔONΔDEVICEΔΔ
CTSOPT.ΔΔ TYPE:ΔEOTA."
Operator response, "6Δ"
5. Machine type out, "YACTSLΔΔΔØ11GΔΔASSGNΔCTSOPT"
Operator response, "YΔØ3"
6. Machine type out, "YACTSLΔΔΔØ11GΔΔASSGNΔCTSWRK"
Operator response, "YΔØ4"
7. Machine type out, "6ACTSLΔΔΔΔTYPEΔ'F'ΔTOΔINCLUDEΔ
BADΔOUTPUT;ΔORA'N'ΔFORANORMALΔDELETION."
Operator response, "6ΔN"

OUTPUT

1. Tape CTSOPT (Ø3) contains the good script records.
2. The printer (L1) contains a listing of the scripts
plus any error messages.

Card to Tape Decode Table Loader (DECJNK)

DECJNK reads decode tables punched on cards and builds records that are in the TSIM record format and writes these records to a tape. DECJNK also prints some error diagnostics.

INPUT

1. The ISVD Program Load Library.
2. One or more decode table card decks plus parameter.

OTHER EQUIPMENT

1. An ISVD tape for output.
2. A scratch tape.
3. A printer.

SET UP

1. Mount the ISVD Program Load Library on a disc pack (e.g. A2).
2. Place the decode table cards in a card reader (e.g. R1).
3. Mount the output tape, ring in, on a tape drive (e.g. Ø1).
4. Mount the scratch tape, ring in, on a tape drive (e.g. Ø5).
5. Ready a printer (e.g. L1).

OPERATIONS (per example)

1. Operator type in, "EALODADDECJNK,A2,,R1"
2. Machine type out, "YADDECJNKΔØ11GAAASSGNΔPUTMAG"

Operator response, "YΔ01"

3. Machine type out, "YΔDECJNKΔ011GΔΔASSGNΔCARDRD"

Operator response, "YΔR1"

4. Machine type out, "YΔDECJNKΔ011GΔΔASSGNΔMACH"

Operator response, "YΔ05"

5. Machine type out, "YΔDECJNKΔ011GΔΔASSGNΔSCNPNT"

Operator response, "YΔL1"

OUTPUT

1. The output tape (01) will contain the tape records of the decode tables in TSIM record format.
2. The printer (L1) will contain any error messages.

Tape to Tape Data Base Formatter (TAPJNK)

TAPJNK reads in a control deck and then processes data base card images on tape into the TSIM data base record format. TAPJNK also recodes data according to specifications on the control deck and will rearrange the order of the data within a record as specified. The formatted records are written to an output tape. A printed listing of unexpected codes in the data is also provided by record name.

INPUT

1. The ISVD Program Load Library.
2. A TAPJNK control deck.
3. An ISVD data base card image tape.

OTHER EQUIPMENT

1. A Reader.
2. A Printer.
3. A TAPJNK output tape.

SET UP

1. Mount the ISVD Program Load Library on a disc drive (e.g. A0).
2. Place the TAPJNK control deck in the card reader (e.g. R1).
3. Mount the ISVD card image tape, ring out, on a tape drive (e.g. 05).
4. Mount the TAPJNK output tape, ring in, on a tape drive (e.g. 06).

5. Ready a Printer (e.g. L1).

OPERATIONS (per example)

1. Operator type in, "EALODATAPJNK,AØ,,R1"
2. Machine type out, "YΔTAPJNKΔØ11GAAASSGNΔINCRD1"
Operator response, "YΔR1"
3. Machine type out, "YΔTAPJNKΔØ11GAAASSGNΔPRT1"
Operator response, "YΔL1"
4. Machine type out, "YΔTAPJNKΔØ11GAAASSGNΔPUTMAG"
Operator response, "YΔØ6"
5. Machine type out, "6ΔTAPJNKΔ16PDAΔSNAPS"
Operator response, "6ΔI"
6. Machine type out, "6ΔTAPJNKΔ16ØDAΔOP/DEV"
Operator response, "6ΔP"
7. Machine type out, "YΔTAPJNKΔØ11GAAASSGNΔINTAP1"
Operator response, "YΔØ5"
8. Machine type out, "6ΔTAPJNKΔCONTINUE?"
Operator response--if there are more cards in the card
reader, "6ΔY"--if there are no more cards left, "6ΔN"

OUTPUT

1. The TAPJNK (Ø6) output tape contains the ISVD data base records in their proper form for loading onto ISVD disc packs.
2. The printer (L1) contains a listing of all codes on all cards that were found to be outside the expected range for codes.

Tape to Tape Record Name Decoder (OMNJNK)

OMNJNK reads in a decode table (\$LØ) from a tape prepared by DECJNK. Then OMNJNK reads in the records from a tape created by TAPJNK, replaces the coded record name with the decoded record name, and writes the records to an output tape.

INPUT

1. A DECJNK tape containg \$LØ.
2. A TAPJNK tape containing coded records with coded record names.
3. A run time parameter deck of cards.

OTHER EQUIPMENT

1. The ISVD Program Load Library.
2. A Reader.
3. A Printer.
4. An ISVD tape for output.

SET UP

1. Mount the ISVD Program Load Library on a disc drive (e.g. A1).
2. Place the run time parameters in the card reader (e.g. R1).
3. Ready a printer (e.g. L2).
4. Mount the DECJNK output tape, ring out, on a tape drive (e.g. Ø2).
5. Mount the TAPJNK output tape, ring out, on a tape drive (e.g. Ø3).

6. Mount the ISVD tape for output, ring in, on a tape drive (e.g. Ø4).

OPERATIONS (per example)

1. Operator type in, "EALODAO MNJNK, A1, , R1"
2. Machine type out, "YAO MNJNK A Ø11GAAASSGN A DATA1"
Operator response, "Y A Ø3"
3. Machine type out, "YAO MNJNK A Ø11GAAASSGN A DECOD1"
Operator response, "Y A Ø2"
4. Machine type out, "YAO MNJNK A Ø11GAAASSGN A PUTMAG"
Operator response, "Y A Ø4"
5. Machine type out, "YAO MNJNK A Ø11GAAASSGN A PRT1"
Operator response, "Y A L2"
6. Machine type out, "6AO MNJNK A A TO A OUTPUT A UNDECODED A
RECORDS, A TYPE A Y, A A TYPE A N A TO A OMIT."
Operator response, "6 A N"

This message only occurs when there are some undecoded record names.

OUTPUT

1. The output tape (Ø4) will contain the records in the same format as TAPJNK but the record names will have been decoded according to \$LØ on the DECJNK tape.
2. The printer (L2) will contain a listing of all records not decoded.

BTSS Disc Initialization (BTSSDI)

BTSSDI prepares disc packs to be used by BTSS.

INPUT

1. Four disc packs.
2. An MBTS Load Tape.

OTHER EQUIPMENT

1. Four disc drives.

SET UP

1. Mount a disc pack on each of four disc drives (e.g. 140, 253, 252, and 251.)
2. Mount the MBTS Load Tape, ring out, on a tape drive (e.g. 04).

OPERATIONS (per example)

1. Set the Console Load dial to 304 and in order hit STOP, GEN RESET, and LOAD.
2. Machine type out, "LIBAMAINAYESAORAEOT"
Operator replies by hitting the "EOT" key.
3. Machine type out, "ENTERASYSTEMAIDENTIFICATIONADATEAANDATIME"
Operator response, "01/01/690000"
4. Machine type out, "ASSIGNAPRIMARYADISC"
Operator response, "140I"
5. Machine type out, "ASSIGNASECONDARYADISCS"
Operator response, "253I,252I,251I"

6. Machine type out, "ASSIGNASECONDARYDISCS"

No operator response--the job is done.

OUTPUT

1. The disc pack on 140 is now initialized as a
Primary Disc.
2. The disc pack on 253 is now initialized as a
Secondary #1 Disc.
3. The disc pack on 252 is now initialized as a
Secondary #2 Disc.
4. The disc pack on 251 is now initialized as a
Secondary #3 Disc.

TSIM Disc Initializer (DASMLØ)

DASMLØ initializes a disc pack that has previously been initialized by BTSS. The DASMLØ initialization prepares a pack to receive ISVD data or scripts such that TSIM will later be able to access these data or scripts. DASMLØ also builds a table of disc areas and the names of files that can be found in each area.

INPUT

1. A disc pack that has been initialized by BTSS.
2. A DASMLØ card deck.
3. The ISVD Program Load Library.

OTHER EQUIPMENT

1. A Reader.
2. A Printer.

SET UP

1. Mount the output disc pack on a disc drive (e.g. A2).
2. Put the DASMLØ card deck in the card reader (e.g. R1).
3. Ready a Printer (e.g. L1).
4. Mount the ISVD Program Load Library on a tape drive (e.g. Ø6).

OPERATIONS (per example)

1. Operator type in, "EALODADASMLØ,Ø6"
2. Machine type out, "YADASMLØΔØ11GAΔASSGNΔSYSLST"
Operator response, "YΔL1"
3. Machine type out, "YADASMLØΔØ11GAΔASSGNΔDISCDR"

Operator response, "YΔA2"

4. Machine type out, "YΔDASM1ØΔØ11GAAASSGNΔSYSRDR"

Operator response, "Y ΔR1"

5. Machine type out, "YΔDASM1ØΔØ11GAAASSGNΔDISCDR"

Operator response, "YΔA2"

6. Machine type out, "6ΔDASM1ØΔBEGINΔRECAP"

Operator response, "EΔHLTΔ6"

OUTPUT

1. A disc pack (A2) that has been initialized for ISVD files.
2. A listing (L1) of the operations performed by DASM1Ø.

Tape to Disc Loader (DSCLOA)

DSCLOA loads ISVD data and scripts to the disc packs. This program also creates a table (\$DSTBL) that is used by TSIM to relate descriptor names with the names of the appropriate decode tables. DSCLOA also loads the \$DSTBL to the disc pack.

INPUT

1. One reel of magnetic tape that contains the data or scripts to be loaded. This tape is usually the output of OMNJNK, CTSL, or DECJNK although occasionally TAPJNK output is used.
2. A DSCLOA control deck that is set up for the data base to which the data or scripts belong.
3. A disc pack that has been initialized by DASML0 to receive the data base.
4. The ISVD Program Load Library.

OTHER EQUIPMENT

1. One scratch tape.
2. A Printer.

SET UP

1. Mount the input tape, ring out, on a tape drive (e.g. 01).
2. Mount the scratch tape, ring in, on a tape drive (e.g. 02).
3. Place the cards in the reader (e.g. R1).

4. Mount the disc pack on a disc drive (e.g. A3).
5. Mount the ISVD Program Load Library on a 9-level tape drive (e.g. 05).
6. Ready a printer (e.g. L2).

OPERATIONS (per example)

1. Operator type in, "E_ΔLOD_ΔDSCLOA,05,,R1"
2. Machine type out, "Y_ΔDSCLOA_Δ011GA_ΔASSGN_ΔCARDRD"
Operator response, "Y_ΔR1"
3. Machine type out, "Y_ΔDSCLOA_Δ011GA_ΔASSGN_ΔDSCDRV"
Operator response, "Y_ΔA3"
4. Machine type out, "6_ΔDSCLOA_ΔEND_ΔDASM-20"
Machine type out, "Y_ΔDSCLOA_Δ011GA_ΔASSGN_ΔTPDATA"
Operator response, "Y_Δ01"
- 4a. (may occur)
Machine type out, "6_ΔDCSLOA_Δ5018A_ΔTOBYTAP_Δ02"
Operator response, "6_ΔI"
5. Machine type out, "Y_ΔDSCLOA_Δ011GA_ΔASSGN_ΔINSEG"
Operator response, "Y_Δ02"
6. Machine type out, "6_ΔDSCLOA_ΔTABLES_ΔARE_ΔWRITTEN_ΔTO_ΔTAPE"
Machine type out, "6_ΔDSCLOA_Δ5080_ΔWKFLOW_Δ04_Δ000001"
Machine type out, "Y_Δ6_ΔDSCLOA_Δ011GA_ΔASSGN_ΔSCNPNT"
Operator response, "Y_ΔL2"
7. Machine type out, "6_ΔDSCLOA_ΔSCRIPTSB"
Machine type out, "6_ΔDSCLOA_ΔEND_ΔOF_ΔDECK_ΔTHIS_ΔFILE"
Machine type out, "Y_Δ6_ΔDSCLOA_Δ011GA_ΔASSGN_ΔDSCDRV"
Operator response, "Y_ΔA3"

OUTPUT

The initialized disc pack (A3) now contains the data records that were on TPDATA (Ø1) and the \$DSTBL that was created on INSEG (Ø2).

4. Mount the disc pack on a disc drive (e.g. A3).
5. Mount the ISVD Program Load Library on a 9-level tape drive (e.g. 05).
6. Ready a printer (e.g. L2).

OPERATIONS (per example)

1. Operator type in, "EALODADSCLOA,05,,R1"
2. Machine type out, "YADSCLOA011GAASSGNACRDRD"
Operator response, "YAR1"
3. Machine type out, "YADSCLOA011GAASSGNADSCDRV"
Operator response, "YAA3"
4. Machine: 6ADSCLOAENDADASM-20
Machine type out, "YADSCLOA011GAASSGNATPDATA"
Operator response, "YA01"
- 4a. (may occur)
Machine: 6ADSCLOA5018AATOBYPAP02
Operator: 6AI
5. Machine type out, "YADSCLOA011GAASSGNAINSEG"
Operator response, "YA02"
6. Machine type out, "YADSCLOA011GAASSGNASCPNT"
Operator response, "YAL2"

OUTPUT

The initialized disc pack (A3) now contains the data records that were on TPDATA (01) and the \$DSTBL that was created on INSEG (02).

Time Sharing and Information Management (TSIM)

TSIM is the ISVD operating system. Operating TSIM permits up to 16 inquirers at either teletypes or Sanders 720 Consoles to access the ISVD script network and data bases.

INPUT

1. TSIM Load Tape.
2. TSIM disc packs: Primary, Secondary #1, Secondary #2, Secondary #3.
3. User Codes card deck and CCM Initializer card deck.

OTHER EQUIPMENT

1. An ISVD blank log tape.
2. Two scratch tapes.
3. Printer L2.
4. Communications Controller (CCM).
5. Card Reader.

SET UP

1. Mount the TSIM Load Tape, ring out, on a tape drive (e.g. Ø1).
2. Mount the ISVD log tape, ring in, on a tape drive (e.g. Ø2).
3. Mount the two scratch tapes, rings in, on tape drives (e.g. Ø3 and Ø4).
4. Ready the CCM.
5. Ready Printer L2.

6. Place the user codes and CCM Initializer deck in the card reader (e.g. R1).
7. Mount the Primary disc on disc drive 140.
8. Mount Secondary #1 on disc drive 253.
9. Mount Secondary #2 on disc drive 252.
10. Mount Secondary #3 on disc drive 251.

OPERATIONS (per example)

1. Set the Console load dial to 201 and in order hit STOP, GEN RESET, and LOAD.
2. Machine type out, "LIBAMAINAYESAORAEOT"
Operator replies by hitting the "EOT" key.
3. Machine types out, "ENTERASYSTEMAIDENTIFICATIONADATEA
ANDATIME"
Operator response, "01/01/690000"
4. Machine type out, "ASSIGNAPRIMARYADISC"
Operator response, "140"
5. Machine type out, "ASSIGNASECONDARYADISCS"
Operator response, "253,252,251"
6. Machine type out, "ASSIGNASECONDARYADISCS"
Operator response, "253,252,251"
7. Machine type out, "ASSIGNALOGATAPEANDASYSIPT"
Operator response, "202,203"
8. Machine type out, "ASSIGNAINPUTATAPES"
Operator response, "204"
9. Machine type out, "ANYAPROJECTAFILEAUPDATE?"
Operator response, "CARDS"

10. Machine type out, "ENTERΔMM/DD/YYHHMM"
Operator response (e.g. if the date is July 4, 1776
and the time is 2:20 PM then type in, "07/04/761430").
11. Machine type out, "SESSIONΔOPTIONS"
Operator response, "CP"
12. Machine type out, "SESSIONΔPARAMETERΔCHANGES"
Operator replies by hitting the "EOT" key.
13. Machine type out, "ENTERΔPARAMETERS"
Operator response, "CARDS"
14. Machine type out, "ENTERΔPARAMETERS"
Operator replies this time by hitting the "EOT" key.

OUTPUT

1. The inquirers are presented with verbal material
under the direction of the script network.
2. Data is stored to Secondary #3 and the Primary
disc packs under direction of the script network.
3. Data is written to the log tape including every type
in made by every inquirer.

Time Sharing Log Tape Edit (TSLTE)

TSLTE is an RCA BTSS utility program. TSLTE is always used at the end of each MBTS session to put a tape mark at the end of the ISVD log tape. TSLTE is also used to print an ISVD log tape.

INPUT

1. The TSLTE card deck.
2. An ISVD log tape.

OTHER EQUIPMENT

1. Printer L2.
2. Card Reader.

SET UP (at end of MBTS session)

1. An ISVD log tape already is mounted on a tape drive (e.g. Ø1) and has wound in some amount.
2. Place the TSLTE card deck in a card reader (e.g. R1).
3. Ready Printer L2.

OPERATION (at end of MBTS session) (per example)

1. Set the Console load dial to the physical name of R1 which is ØØ4 and in order hit STOP, GEN RESET, and LOAD.
2. Machine type out, "ASSIGNALOG"
Operator response, "2Ø1"
3. Machine type out, "LOGATAPEΔATΔBTLYAORAN"
Operator response, "N"

4. Machine type out, "PUNCHATIMEΔANDΔCHARGESΔYΔORAN"

Operator response, "N"

5. Machine type out, "STARTINGΔTIME"

Operator response, "0000"

OUTPUT (at end of MBTS session)

1. An end of tape mark will have been placed at the end of the logged messages.
2. The contents of the log tape (01) will have been printed on L2.

SET UP (to print a log tape that already has an end of tape mark)

1. Mount the ISVD log tape ring out on a tape drive (e.g. 03).
2. All else as set up above.

OPERATIONS (to print a log tape that already has an end of tape mark) (per example)

1. Load the TSLTE program as above.
2. Machine type out, "ASSIGNΔLOG"
Operator response, "203"
3. Machine type out, "LOGΔTAPEΔATΔBTΔLAYΔORAN"
Operator response, "Y"
4. All else as operations above.

OUTPUT

The contents of the ISVD log tape (03) will be printed on Printer L2.

Tape to Tape Log Save (LOGSAV)

LOGSAV combines ISVD log tapes onto a single tape.

INPUT

1. Some number of ISVD log tapes.
2. The previous LOGSAV output tape (ISVD Master Log Tape)
if there is one.
3. The ISVD Program Load Library.

OTHER EQUIPMENT

1. A magnetic tape for output.

SET UP

1. Mount the first ISVD log tape, ring out, on a tape drive (e.g. Ø1).
2. Mount the output tape, ring in, on a tape drive (e.g. Ø6).
3. Mount the old LOGSAV output tape, if any, and ring out, on a tape drive (e.g. Ø5).
4. Mount the ISVD Program Load Library on a disc pack (e.g. A1).

OPERATIONS (per example)

1. Operator type in, "EALODALOGSAV,A1"
2. Machine type out, "YΔLOGSAVΔØ11GAAASSGNΔLOGTAP"
Operator response, "YΔØ1"
3. Machine type out, "YΔLOGSAVΔØ11GAAASSGNΔBLNKSV"
Operator response, "YΔØ6"

4. Machine type out, "6ΔLOGSAVΔMUSTΔWEΔCOPYΔMASTERΔONTOΔ

BLNKSVΔFIRST?ΔΔYΔORΔN"

Operator response, "6ΔY" if there is an old LOGSAV
output tape, otherwise respond "6ΔN"

5. Machine type out, "6ΔLOGSAVΔØ11GΔΔASSGNΔMASTER"

Operator response, "YΔØ5"

6. Machine type out, "6ΔLOGSAVΔISΔTHEREΔANOTHERΔTSIMΔLOG

TAPEΔFORΔINPUT?ΔΔYΔORΔN"

Operator response, "6ΔN" if there are no more log tapes
to be processed. If there are more log tapes to be
processed then first mount the next log tape on the
same tape drive (Ø1) that the first log tape was on.
Then respond, "6ΔY"

OUTPUT

The LOGSAV output tape BLNKSV will contain all the periods
on the old master tape and all the records on the log
tapes. This BLNKSV would be the master for the next
use of LOGSAV.

Tape to Selective Listing (SELLST)

SELLST reads in an ISVD Master Log Tape (output from LOGSAV) and prints the information contained in a useful format. SELLST prints only those records that are selected through the use of a parameter card deck.

INPUT

1. The ISVD Program Load Library.
2. The SELLST control deck.
3. An ISVD Master Log Tape.

OTHER EQUIPMENT

1. Two Printers.
2. A Card Reader.

SET UP

1. Mount the ISVD Program Load Library, ring out, on a tape drive (e.g. 06).
2. Mount the ISVD Master Log Tape, ring out, on a tape drive (e.g. 05).
3. Ready two printers (e.g. L1 and L2).
4. Place the SELLST control deck in the card reader (e.g. R1).

OPERATIONS (per example)

1. Operator type in, "EALODAMON,,,R1,,100000"
2. Machine type out, "UAMONAAAA0357AASYSLSST"
Operator response, "UAL1"

3. Machine type out, "YASELLSTA011GAAASSGNATHREEP"

Operator response, "YAL2"

4. Machine type out, "YASELLSTA011GAAASSGNALOGTAP"

Operator response, "YA05"

OUTPUT

The only output is a list (L2) of the selected records
from the ISVD Master Log Tape.

Log Tape Systems Statistics (SYSTAT)

SYSTAT reads in an ISVD Master Log Tape and produces a printed summary of certain data contained on the Master Log Tape. A parameter deck specifies that the summarization be done for certain dates.

INPUT

1. The ISVD Program Load Library.
2. An ISVD Master Log Tape.
3. A SYSTAT control deck.

OTHER EQUIPMENT

1. Two Printers.
2. A Card Reader.

SET UP

1. Mount the ISVD Program Load Library, ring out, on a tape drive (e.g. 05).
2. Mount the ISVD Master Log Tape, ring out, on a tape drive (e.g. 06).
3. Ready two printers (e.g. L1 and L2).
4. Place the SYSTAT control deck in the card reader (e.g. R1).

OPERATIONS (per example)

1. Operator type in, "EALODAMON,,,R1,,108192"
2. Machine type out, "UAMONAAAA0357AASYSLSLST"
Operator response, "UAL1"
3. Machine type out, "YAFILESAA011GAAASSGNALOGTAP"
Operator response, "Y06"

4. Machine type out, "YΔFILESΔΔ011GΔΔASSGNΔPRINT"

Operator response, "YΔL2"

OUTPUT

The only output is a printed listing (L2) of the statistics compiled by the program.

Disc to Tape Dump (DASM30)

DASM30 reads an ISVD disc pack and writes all non-deleted records to a tape. DASM30 also prints out the names of all records indicating which records were deleted or written to the tape.

INPUT

1. The ISVD Program Load Library.
2. An ISVD disc pack.

OTHER EQUIPMENT

1. A Printer.
2. A Tape.

SET UP

1. Mount the ISVD Program Load Library on a disc drive (e.g. A1).
2. Mount the ISVD disc pack on a disc drive (e.g. A2).
3. Ready a Printer (e.g. L1).
4. Mount a tape on a tape drive (e.g. 03).

OPERATIONS (per example)

1. Operator type in, "EALODADASM30,A1"
2. Machine type out, "YADASM30A011GAASSGNOUTAP"
Operator response, "YA03"
3. Machine type out, "YADASM30A011GAASSGNASYSLST"
Operator response, "YAL1"
4. Machine type out, "YADASM30A011GAASSGNADSCDRV"
Operator response, "YAA2"

OUTPUT

1. The output tape (03) will contain only the non-deleted records from the ISVD disc pack. This tape is used as input for PREENR or DASM40.
2. The printer (L1) will contain a listing of all record names on the ISVD disc pack with good records and deleted records appropriately flagged.

Tape to Tape Cleanup (PREENR)

PREENR reads in a DASM30 output tape, eliminates records that it recognizes as erroneous, and writes the good records to an output tape.

PREENR also prints the contents of bad records.

INPUT

1. A DASM30 output tape.
2. The ISVD Program Load Library.

OTHER EQUIPMENT

1. A Printer.
2. An output tape.

SET UP

1. Mount the ISVD Program Load Library on a disc pack (e.g. A3).
2. Ready a printer (e.g. L2).
3. Mount the DASM30 output tape, ring out, on a tape drive (e.g. 02).
4. Mount the PREENR output tape, ring in, on a tape drive (e.g. 04).

OPERATIONS (per example)

1. Operator type in, "EALODAPREENR,A3"
2. Machine type out, "YAPREENR011GAAASSGNAINPUT"
Operator response, "Y02"
3. Machine type out, "YAPREENR011GAAASSGNΔOUTPUT"
Operator response, "Y04"

4. Machine type out, "YAPREENRΔ011GAAASSGNALISTER"
Operator response, "YΔL2"

OUTPUT

1. The PREENR output tape (04) will contain only the records accepted by PREENR that were on the DASM30 output tape.
2. The printer (L2) will contain a listing of the contents of records not included on the output tape.

TSIM Disc Restore (DASM40)

DASM40 restores a TSIM disc pack by reading records output from DASM30 or PREENR and writing them to a disc pack that has been initialized by DASM10. DASM40 also lists the names of all records written to the disc pack.

INPUT

1. A DASM30 or PREENR output tape.
2. A disc pack that has been initialized by DASM10.
3. The ISVD Program Load Library.

OTHER EQUIPMENT

1. A Printer.

SET UP

1. Mount the input tape, ring out, on a tape drive (e.g. 02).
2. Mount the output disc pack on a disc drive (e.g. A0).
3. Mount the ISVD Program Load Library, ring out, on a tape drive (e.g. 05).
4. Ready a printer (e.g. L1).

OPERATIONS (per example)

1. Operator type in, "EALODADASM40,05"
2. Machine type out, "YADASM40011GAASSGNΔINTAP"
Operator response, "YΔ02"
3. Machine type out, "YADASM40011GAASSGNΔSYSLST"
Operator response, "YΔL1"
4. Machine type out, "YADASM40011GAASSGNΔDSCDRV"

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Operator response, "YΔAØ"

5. Machine type out, "YΔDASM4ØΔØ11GAAASSGNΔDSCDRV"

Operator response, "YΔAØ"

OUTPUT

1. The disc pack (AØ) now contains the records that were on the input tape.
2. The printer (L1) contains a listing of the names of the records written to the disc pack.

Card Deck List (DEKLST)

DEKLST provides a printed listing of punched cards.

INPUT

1. Punched cards to be listed.
2. The ISVD Program Load Library.

OTHER EQUIPMENT

1. A Printer.
2. A Reader.

SET UP

1. Put the punched cards in the card reader (e.g. R1).
2. Ready a printer (e.g. L2).
3. Mount the ISVD Program Load Library on a disc drive (e.g. A3).

OPERATIONS (per example)

1. Operator type in, "EALODADEKLST,A3"
2. Machine type out, "YADEKLSTA011GAAASSGNAR1"
Operator response, "YAR1"
3. Machine type out, "YADEKLSTA011GAAASSGNAL1AORAL2"
Operator response, "YAL2"

OUTPUT

The only output is a printed list (L2) of the contents of the cards.

APPENDIX E

Choosing a Job by Characteristics

Richard M. Durstine
Lynne Fitzhugh

CHOOSING A JOB BY CHARACTERISTICS

Richard M. Durstine
Lynne Fitzhugh

There are, for the Durstine script, three types of possible interactions: with inquirers who have never had the interview before, with those who just finished their first interview, and with those who have had the interview before. He has written text appropriate to each group, and given adequate though difficult instructions to follow the script.

You can always count on items with the first decimal place the same to be grouped and sequential.

The introduction is followed by the interview paper. This begins (frame 20) with a choice of those aspects of careers that seem important. This answer is saved, and used later. Everyone receives items 31 and 32. Then the answer to 20 is used to decide if a person should receive frames 41, 42, 43, 44, 45. Only those dealing with important aspects of the job are included.

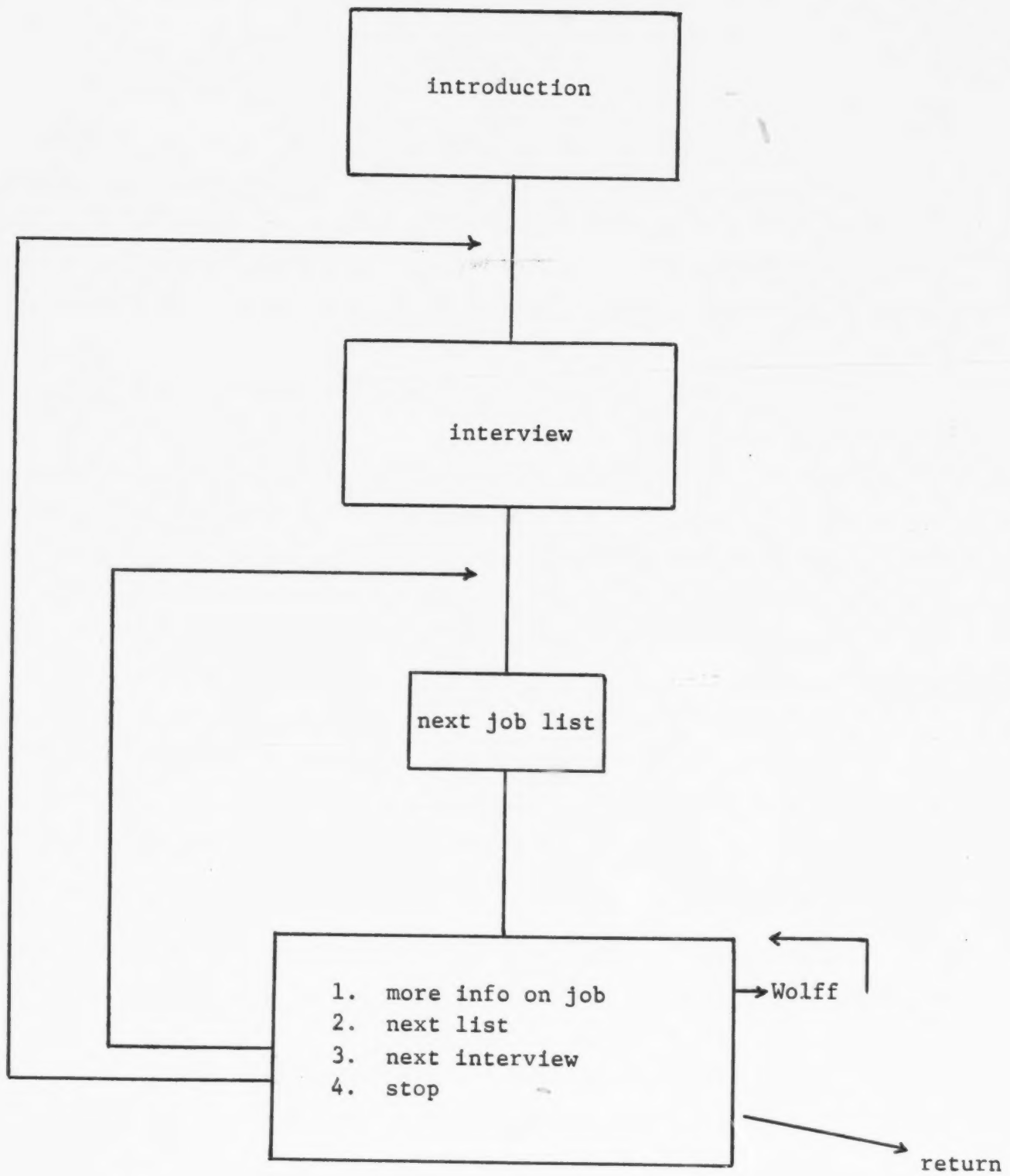
Following the 40's the interview is complete. This leaves a list of possible jobs which may be for purposes of this demonstration as many as eleven.

A simplified flow chart can be found on the following page.

Explanation of coding system

Each script section is identified by a descriptive code number. The first two digits identify the section of the interview.

- 10. = Introduction
- 11. = Summary of previous interview
- 20. = General category selection
- 31. = Activities section
- 32. = Aptitudes selection
- 41. = Physical demands selection
- 42. = Working conditions selection



- 43. = Education selection
- 44. = Salary selection
- 45. = Security selection
- 50. = List of 10 jobs
- 51. = If more than 10 jobs total
- 52. = If 10 or less total
- 53. = If no jobs total
- 60. = Summary description
- 70. = Detailed description

The third digit represents the serial number of the interview for the inquirer:

- .1 = First Interview
- .2 = Second Interview
- .3 = Third Interview
- .0 = Any Subsequent Interview

The final digit represents the serial number of the passage through the sequence of questions during the present interview:

- .1 = First time, sequential flow
- .2 = Second time, sequential flow
- .3 = Return loop from farther on in interview, first time
- .4 = Return loop from farther on, any subsequent time
- .0 = Any subsequent time, sequential flow

Where there is an additional digit in the code number it indicates that this is one of the variations in a cycle, as described earlier.

The letters in the column to the left of the text indicate the form and type of the activity represented in the text:

A = Audio message from system to inquirer

CRT = Information presented by cathode ray tube .

Copy = Message printed on paper

I = Reaction by system to the various possible meaningful responses by the inquirer. Error messages for null or nonsense responses should be provided as well.

In the description of the processing of inquirer's response, R denotes "reject all jobs" and I denotes "include all jobs" that have the

given characteristics. After "R" or "I" are given the contents of and addresses in the data base (based on the User's Manual and Description of the DOT Tape, both by L. Wolff), on which the rejections or inclusions will be based.

The preferences stated by the inquirer will be preserved in a "Student Preference Storage" facility provided for the purpose. Any other information which needs to be preserved from the interview (e.g., lists of selected jobs) should be included here as well. This storage facility will be used in the selection of lists of jobs that fit the inquirer's requirements, in retaining such lists, and as a source of information for summaries of the interview.

The script for the summary of previous interviews has not yet been prepared. An outline and rough format of its contents are given instead.

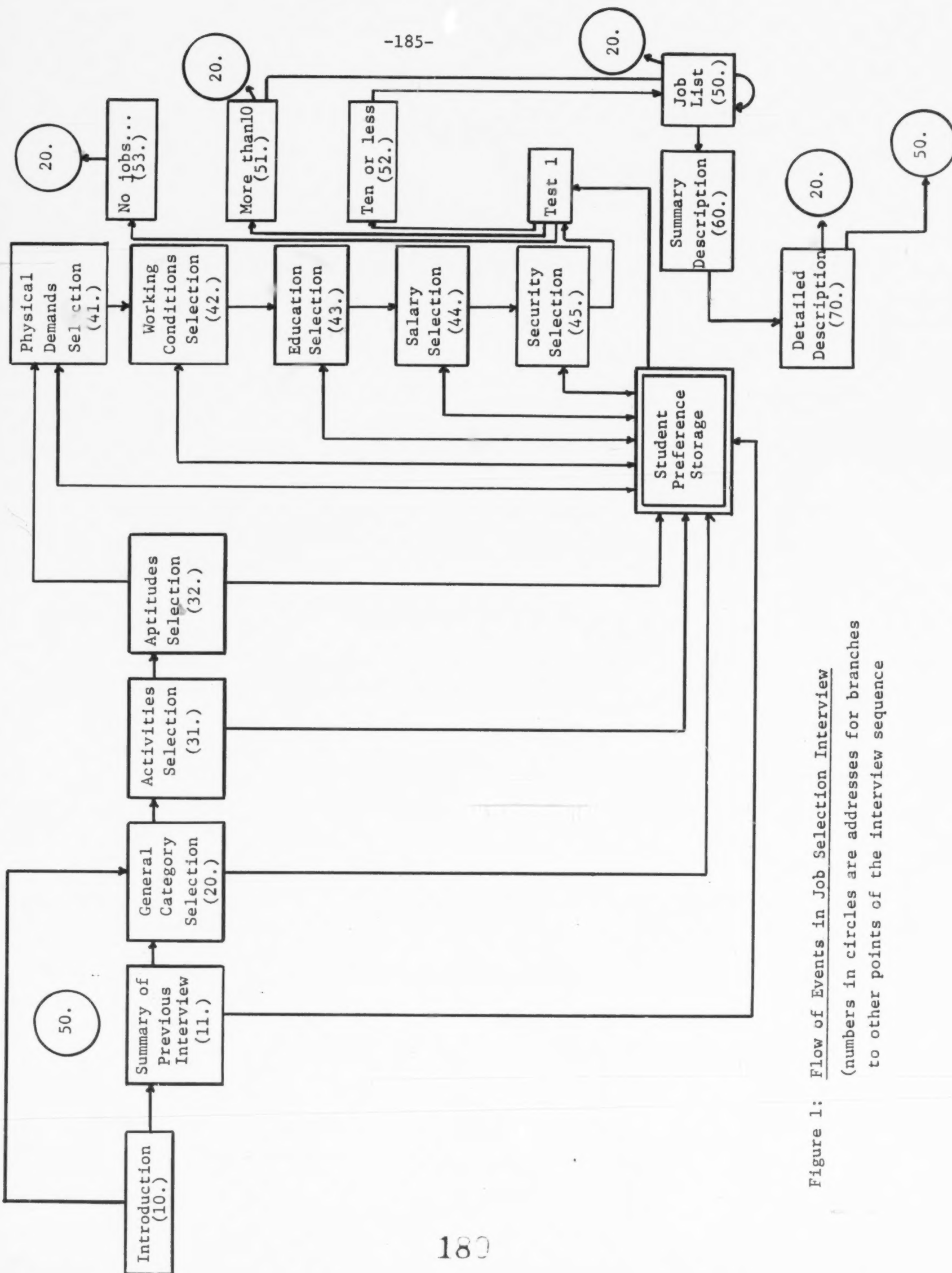


Figure 1: Flow of Events in Job Selection Interview
(numbers in circles are addresses for branches to other points of the interview sequence)

I. FIRST INTERVIEW, FIRST TIME THROUGH

*10.11 (Introduction, First Interview)

A A great deal of information about many jobs is now at your disposal. You are encouraged to explore it in whatever way you wish.

You may use the information to help you decide on and plan a specific career, or you may use it to satisfy your curiosity about a wide range of job interests. You can let the computer guide you through the material by simply responding to its programmed questions, or you can take over, when you are familiar with the program, and guide the computer in the directions that best suit your purpose.

Whichever your approach, it is necessary for the computer to understand your questions and responses, and it must, of course, have the data you request in store. The series of statements and responses following this introduction and leading up to the list of selected occupations for your exploration has been designed to provide you with free access to the stored information. Follow the directions closely. If you find you are in an avenue which does not interest you, there is usually a way to go back and choose a different one. Likewise, if you wish to revise your responses so as to get a better list of jobs from the computer, you may do so any number of times. All this will become plain to you during the interview.

Good exploring!

[Go to *20.11]

*20.11 (Selection of Categories, First Interview, First Time)

A There are many things about jobs that appeal to people. Some of these are steady work, good pay, a chance to get ahead. To help decide which possibilities you might look at in detail, you should indicate which things are most important to you.

CRT
A

1. The physical demands placed upon you
2. The working conditions you are likely to experience
3. The level of education you would need
4. Your likely level of income
5. Opportunities for security or advancement

A Indicate as many or as few of these five categories as you like. Pick the ones you think will be most important to you in choosing a career. You will have a chance to change your choice later if you wish.

I . [Inquirer Response  to Student Preference Storage]

[Go to *31.11]

*31.11 (Activities Selection, First Interview, First Time)

- A There are surely some types of activity you prefer over others.
On the screen you see five possible choices. These choices will be
used to help select job possibilities for you to consider.
- CRT A.1 Dealing with things and objects
 or
 A.2 Dealing with people and communicating ideas.
 B.1 Doing business work
 or
 B.2 Doing scientific or technical work.
 C.1 Routine, organized work
 or
 C.2 Creative or unstructured work.
 D.1 Working in social situations
 or
 D.2 Working with machines and processes.
 E.1 Getting praise or prestige from others
 or
 E.2 Working mainly for your own satisfaction.
- A Make as many or as few choices as you like, but not both alternatives of
a pair. Where you have no definite feeling, make no choice. These
choices can be changed later.
- I A.1 → Reject if 6 in 9.1, 9.2, or 9.3
 A.2 → R if 1 in "
 B.1 → R if 7 in "
 B.2 → R if 2 in "
 C.1 → R if 8 in "
 C.2 → R if 3 in "
 D.1 → R if 9 in "
 D.2 → R if 4 in "
 E.1 → R if 0 in "
 E.2 → R if 5 in "
 [Inquirer Responses → to Student Preference Storage]
 [Go to *32.11]

*32.11 (Aptitudes Selection, First Interview, First Time)

A Fine, let's go on now.

Everyone has certain talents or aptitudes which cause him to do some things better than others. Here is a list of some such aptitudes. Indicate those in which you feel yourself strong (better than most people your age) and in which weak. If you feel you are about average, indicate nothing for that aptitude.

- CRT
A
- G1. High in general intelligence
 - G2. Low in general intelligence
 - V1. High in ability to use words and language.
 - V2. Low in ability to use words and language
 - N1. High in ability with mathematics and numbers
 - N2. Low in ability with mathematics and numbers
 - P1. High in ability to interpret pictures or forms in space
 - P2. Low in ability to interpret pictures or forms in space
 - C1. High in ability to do clerical work
 - C2. Low in ability to do clerical work
 - M1. High in ability to work with hands and fingers
 - M2. Low in ability to work with hands and fingers

A Make as many or as few selections as you like. These can be changed later if your ideas about these things change.

- I
- G1 → R if 4 or 5 in DOT 10.1
 - G2 → R if 1 or 2 in "
 - V1 → R if 4 or 5 in DOT 10.2
 - V2 → R if 1 or 2 in "
 - N1 → R if 4 or 5 in DOT 10.3
 - N2 → R if 1 or 2 in "
 - P1 → R if 4 or 5 in DOT 10.4, DOT 10.5
 - P2 → R if 1 or 2 in "
 - C1 → R if 4 or 5 in DOT 10.6
 - C2 → R if 1 or 2 in "
 - M1 → R if 4 or 5 in DOT 10.7, DOT 10.8, DOT 10.9
 - M2 → R if 1 or 2 in "
- [Inquirer Responses → to Student Preference Storage]
[Go to *41.11]

*41.11 (Physical Demands Selection, First Interview, First Time)

[if no response to item 1 of *20.11, go to *42.11]

- A You showed interest if the physical demands that your work will place on you.

Please indicate first the heaviest lifting or carrying you wish to consider.

- CRT
1. Very light (occasional lifting, ten pounds maximum)
 2. Light (twenty pounds maximum)
 3. Medium (50 pounds maximum lifting)
 4. Heavy lifting (100 pounds maximum)
 5. Very heavy lifting (more than 100 pounds)

- I
- 1 R if L, M, II, V in DOT 14.1
 - 2 R if M, II, V in DOT 14.1
 - 3 R if H, V in DOT 14.1
 - 4 R if V in DOT 14.1
 - 5 (no rejections)

[Inquirer Responses → to Student Record Storage]

- A Now which of the following kinds of activities do you want to exclude from your work. Name as many as you wish. As usual, these choices can be changed later.

- CRT
- A
11. Climbing or balancing
 12. Bending your body -- that is, stooping, kneeling, crouching, crawling
 13. Extensive use of your hands (reaching, handling, fingering, or feeling)
 14. Talking, hearing, or understanding sounds
 15. Seeing accurately or watching carefully

[Inquirer Response → to Data Base]

- I
- 11 → R if 2 in 14.2
 - 12 → R if 3 in 14.3
 - 13 → R if 4 in 14.4
 - 14 → R if 5 in 14.5
 - 15 → R if 6 in 14.6

[Inquirer Responses B → to Student Preference Storage]

[Go to *42.11]

*42.11 (Working Conditions Selection, First Interview, First Time)
[if no response to item 2 of *20.11, go to *43.11]

A You indicated an interest in working conditions. There are a number of different kinds of working conditions that might influence a person's choice of occupations. Some are things he seeks as desirable. Others are things he tries to avoid.

First you will be given a set of characteristics that you might strongly desire, and then a set you might wish to avoid. Indicate as many things in each set as you like. But be careful not to contradict yourself or you may find that no possibilities are left open to you. If that happens to you in fact, there is no great harm done, but you will have to revise your selection of job characteristics.

Now indicate which of the following characteristics you would very much like your job to have. Name as many as are important to you.

CRT

1. Workers in this occupation are usually males.
2. Workers in this occupation are usually females.
3. Work is mostly indoors.
4. Work is mostly outdoors.
5. Work is normally on weekdays only.
6. Work is normally regular daylight hours only.
7. Long distance or overnight travel is involved.

- I 1 → I if 1, 2, or 9 in 19
2 → I if 4, 5, or 9 in 19
3 → I if I or B in DOT 15.1
4 → I if O or B in DOT 15.1
5 → I if 1, 2, or 9 in 22
6 → I if 1, 2, or 9 in 23
7 → I if 1, 2, or 9 in 24

[Inquirer Response → to Student Preference Storage]

A So much for the positive traits you would desire of your work. Now consider some traits you might want to avoid. Indicate from the list below those traits that would cause you to strongly avoid an occupation. Note that some of these traits also appeared on the preceding list of positive characteristics, because some people will seek what others avoid. Take care, then; not to be inconsistent. As usual, your choices can be adjusted later if you like. Here is the list.

CRT
A

11. Workers in this occupation are predominantly males.
12. Workers in this occupation are predominantly females.
13. Workers are exposed to extreme cold.
14. Workers are exposed to extreme heat.
15. Workers are often in wet or damp places.
16. There is much noise and vibration.
17. The work is often hazardous.
18. There are often fumes, odors, dust, or bad ventilation.
19. Work is usually indoors.
20. Work is usually outdoors.
21. There is frequent weekend work.
22. There is frequent night work.
23. Long distance or overnight travel is often involved.

- I 11 → R if 1 or 2 in 19
12 → R if 4 or 5 in 19
13 → R if 2 in DOT 15.2
14 → R if 3 in DOT 15.3
15 → R if 4 in DOT 15.4
16 → R if 5 in DOT 15.5
17 → R if 6 in DOT 15.6
18 → R if 7 in DOT 15.7
19 → R if I in DOT 15.1
20 → R if 0 in DOT 15.1
21 → R if 3 in 22
22 → R if 3 in 23
23 → R if 1 in 24

[Inquirer Response → to Student Preference Storage]

[Go to *43.11]

*43.11 (Education Selection, First Interview, First Time)

[if no response to item 3 of *20.11, go to *44.11]

A Clearly you recognize that education is very important to the kind of work you will eventually do. Indicate below the type and highest level of schooling you expect for yourself. If you are not quite sure, make one choice now and try some other one later on. Your choice here will be used to select jobs that are appropriate to your expected educational level, but that do not require a higher level. Here is the list. Indicate your highest level.

CRT
A

1. Not complete high school
2. Complete academic high school
3. Complete vocational high school
4. Schooling (business or technical school, junior college) after high school, less than full college
5. Full college
6. Post graduate work after college

- I 1 → I if 1 or 9 in 17 or 1 in 18
2 → I if 2 or 9 in 17 or 2 in 18
3 → I if 3 or 9 in 17 or 3 in 18
4 → I if 4, 5, 6, or 9 in 17 or 4, 5, 6 in 18
5 → I if 7 or 9 in 17 or 7 in 18
6 → I if 8 or 9 in 17 or 8 in 18

[Inquirer Responses → to Student Preference Storage]

[Go to *44.11]

*44.11 (Salary Selection, First Interview, First Time)

[if no response to item 4 of *20.11, go to *45.11]

A In the beginning and throughout your working life salary is naturally a very important part of your choice of a career.

There is so far very little reliable information available on salaries and wages. Some selection can be made, however, in terms of today's income levels by typical members of various jobs and professions. You can help in selecting jobs for your further detailed consideration by stating if

- CRT
A
1. You would be satisfied by relatively low income (less than \$7500 yearly, which is to say less than \$150 weekly or \$3.75 hourly).
 2. You would be satisfied with eventually at least middle income, that is, up to \$15,000 yearly or \$300 weekly.
 3. You want to have a good chance of higher income, that is, over \$15,000 yearly.

I 1 → I everything

2 → R if less than 7500 in either 13.6-10 or 13.11-15; or less than 150 in 12.4-6 or 12.7-9; or less than 3.75 in 11.5-8 or 11.9-12

3 → R if less than 15,000 in either 13.6-10 or 13.11-15; or less than 300 in 12.4-6 or 12.7-9; or less than 7.50 in 11.5-8 or 11.9-12

[Inquirer Response → to Student Preference Storage]

[Go to *45.11]

*45.11 (Security Selection, First Interview, First Time)

[if no response to item 5 of *20.11, go to Test 1]

A Since you mentioned desire for security and advancement, some of the factors that might appeal to you are listed below. Please indicate those you would find particularly important for your work to have. Indicate as many as you like. You will have a chance to change these and try other possibilities later if you care to.

- CRT
A
1. Employment is not affected by seasonal fluctuation in demand for workers.
 2. Self employment is an eventual possibility.
 3. An increasing number of employment opportunities is expected.

I 1 → R if 1 in 25

2 → R if 2 in 29

3 → R if 1 or 2 in 31

[Inquirer Responses → to Student Preference Storage]

[Go to Test 1]

Test 1 (Internal to System)

[Form list of selected jobs based on student choices given above]

[Store total list of selected jobs in Student Preference Storage]

[Count selected jobs -- If more than 10, go to *51.00 with number added

Count selected jobs -- If less than 10, go to *52.00

Count selected jobs -- If zero, go to *53.00]

*51.00 (if there are more than 10 jobs remaining on the list)

A The choices you have made have been such that there are [] occupations which fit the specifications you named. You can go back and change some of your choices if you like, or you can be given a list of ten of the most popular jobs on the list to select from for further information about the individual job. Check only one of the choices below.

CRT 1. Go back and change some of my choices.

A 2. Get a list of ten popular jobs from the list.

I 1 → Go to *20.14 if first return or otherwise to *20.04

2 → Go to *50.00

*52.00 (if there are less than 10 but not zero jobs on the list)

A You will now be given a list of the jobs that suit your conditions.
[Go to *50.00]

*53.00 (if there are no jobs on the list)

A Your requirements are so strict that you have one way or another eliminated all the jobs that are included here. You will now be given the opening part of this procedure again. Try to select somewhat less demandingly than you did before.

[Go to *20.14 if first return, or otherwise to *20.04]

List Selection: There needs to be established a rating of jobs in Student Preference Storage by groups of 10 for delivery to the inquirer.

*50.00 (List of 10 jobs, any interview, any time through, from anywhere)

A On the screen is a list of ten jobs for you to explore

CRT 1. Title; I.D.#
 2. " "
 3. " "
 4. " "
 5. " "
 6. " "
 7. " "
 8. " "
 9. " "
 10. " "

[Retain List in Student Preference Storage]

A Choose one at a time, those which interest you. If none interest you, your other choices are:

CRT 11. Return to the beginning
A 12. Get next 10 jobs, if there are more.

[Inquirer Response]

I 1-10. → Go to *60.00 of # chosen
11. → Go to *20.14 (first return) or otherwise to *20.04
12. → Go to next *50.00

*60.00 (Summary Description, any interview, any time through)

Copy [For example, first paragraph of job description as presented in
"A Procedure for Writing Job Descriptions by Computer," by L. Wolff]

A If you want more information on this job, you should choose to
go on to the next part. Otherwise, ask for another job on your list or
go back to the beginning of the interview.

CRT 1. Get detailed description

A 2. Return to list for another choice

3. Return to beginning

4. Get names of next ten jobs, if there are more

[Inquirer Response]

1. To *70.00 of above I.D.#

2. To CRT *50.00/1-10

3. To *20.14 (if first return) or *20.04

4. Go to next *50.00

*70.00 (Detailed Description, any interview, any time through)

Copy [Remainder of description as prepared by L. Wolff]

A Now you may choose to

CRT 1. (onward choices, not yet defined)

A 2. Return to the beginning of the interview

3. Return to your list of jobs

4. Get names of next ten jobs, if there are more

[Inquirer Response]

1. (not yet available)

2. To *20.14 (if first time) or *20.04

3. To CRT *50.00/1-10

4. Go to next *50.00

II. FIRST INTERVIEW; SECOND TIME THROUGH

*20.14 (Selection of Categories; First Interview, Second Time, From Farther in Interview)

A You have chosen to return to the beginning of the interview. Now you know that the choices you make will be used by the computer to pick a list of jobs which may be of interest to you. If you change any of your choices you will get a slightly different, or perhaps very different, list this time. You may want to leave some of the sections the same as before, in which case indicate only the final alternative in the list which says "Retain my previous choices."

Here is the first selection. Choose any of the alternatives which you feel are important in considering a job for yourself.

CRT [list, as under *20.11]

plus: 6. Retain my previous choices.

I [Process inquirer response, as under *20.11; if "6", retain previous responses in Student Preference Storage]

[Go to *31.12]

*31.12 (Activities Selection, First Interview, Second Time)

A Now, if you remember, you should give some thought to the kinds of activities listed on the screen and select those which you prefer. Make as many or as few choices as you like, but not both alternatives of a pair. If you have no definite preference in one area, make no choice. The choices may be changed later if you want.

CRT [list, as under *31.11]

plus: F. Retain my previous choices

I [Process inquirer response, as under *31.11; if "F", retain and use previous responses]

[Go to *32.12]

*32.12 (Aptitudes Selection, First Interview, Second Time)

A One is not always sure about his talents and weaknesses, but since your own will play a role in the job you choose, you should try to judge yourself in these terms. Some areas in which you may or may not have ability are listed. Select only those in which you feel you are better or worse than most people your age. Do not select any in which you think you are about average.

CRT [list, as under *32.11]

A plus: N. Retain my previous choices

A Make as many or few choices as you want without contradicting yourself. You will as usual be able to change your choices later if you are unsure, or if your ideas change again.

I [Process inquirer response, as under *32.11; if "N", retain and use previous responses]

[Go to *41.12]

*41.12 (Physical Demands Selection, First Interview, Second Time Through)

[if no response to item 1 of *20.14, go to *42.12]

A Since you feel that the physical demands of a jobs are important to you, please indicate the heaviest lifting you would want to do.

CRT [list A, as under *41.11]

A plus: 6. Retain my previous choices

I [Process inquirer response, as under *41.11; if "6", retain and use previous responses]

A Which of the next list of activities would you definitely not want to do in a job? Take into account mainly the actual physical disabilities you may have, such as poor eyesight, stuttering, fear of heights, etc. If you have other dislikes you may include them but remember that they will further limit the list of jobs you are given and may exclude some which would have greater advantages to you than the disadvantage of a minor physical dislike.

CRT [list B, as under *41.11]

A plus: 16. Retain my previous choices

I [Process inquirer response, as under *41.11; if "16", retain and use previous responses]

[Go to *42.12]

*42.12 (Working Conditions Selection, First Interview, Second Time Through)
[if no response to item 2 of *20.14, go to *43.12]

A There are two parts to this section of the interview. You have stated an interest in the working conditions a job might impose on you. In the first part of this section you should indicate those working conditions which you would strongly desire. In the second part you should indicate those which you would strongly wish to avoid. Choose as many of the alternatives in each part as you wish, but do not contradict yourself, and remember that each choice you make will limit the list of jobs offered you. If this happens, you may revise your choices later.

 Which of these characteristics would you want your job to have?

CRT [list A, as under *42.11]

A plus: 8. Retain my previous choices

I [Process inquirer response, as under *42.11; if "8", retain and use previous responses]

A Which of the characteristics shown below would you strongly wish to avoid? If you don't care, indicate nothing for that alternative.

CRT [list B, as under *42.11]

A plus: 24. Retain my previous choices

I [Process inquirer response, as under *42.11; if "24", retain and use previous responses]

[Go to *43.12]

*43.12 (Education Selection, First Interview, Second Time Through)

[if no response to item 3 of *20.14, go to *44.12]

A The level of education you attain will be one of the most important factors in the job you will eventually hold. You may not be sure how far you will go, but give the question serious thought and indicate the highest level you feel at this time you would like to, and could, attain. As usual, you will have the chance to change your choice later.

CRT [list, as under *43.11]

A plus: 7. Retain my previous choices

I [Process inquirer response, as under *43.11; if "7", retain and use previous responses]

[Go to *44.12]

*44.12 (Salary Selection, First Interview, Second Time Through)

[if no response to item 4 of *20.14, go to *45.12]

A You have said that salary is an important job factor or you. Although there is very little reliable information on salaries today, indicate the level of income you think would satisfy you, and whatever data the computer has will influence your selection of jobs. Be as realistic as you can at this stage. You may, of course, always change your mind on a later run through the interview.

CRT [list, as under *44.11]

plus: 4. Retain my previous choices

I [Process inquirer response, as under *44.11; if "4", retain and use previous responses]

[Go to *44.12]

*45.12 (Security Selection, First Interview, Second Time Through)

[if no response to item 5 of *20.14, go to "Test 1"]

A According to your earlier choice, job security is an important factor to you. Security in a job may take several forms, some of which are listed here. Indicate as many of these as you feel might be the kind of security you would like to have.

CRT [list, as under *45.11]

plus: 5. Retain my previous choices

I [Process inquirer response, as under *45.11; if "5", retain and use previous responses]

[Go to "Test 1"]

III. INTRODUCTION TO SECOND AND THIRD INTERVIEWS

*10.21 (Introduction, Second Interview)

A Some time may have passed since your first interview, so let us briefly review the instructions. If last time you had a chance to return more than once from the list of jobs to the beginning of the interview, you know that you have opportunities to change your mind about the characteristics of jobs which interest you. You will be able to do that again this time, and in each interview following, so experiment, and explore. Be careful, though, not to contradict yourself or you will find that you have cancelled out all the jobs and will then have to repeat the interview in order to obtain a list of titles to examine.

 If you do not wish to go through the interview again you may begin with the list of jobs you were working on in your first interview.

[Go to *11.00]

*10.31 (Introduction, Third Interview)

A Welcome back for a third exploration of jobs. You are probably quite familiar with the interview by now, but let us go over the instructions once again. Your first choice will be whether to begin with a clean slate, or to begin where you left off last time, that is, in the exploration of your last list of jobs. If you begin with the interview, remember to be consistent in your choices. If you begin with the list, don't forget that you may go back to the interview whenever you have finished exploring the jobs which interested you. Follow directions, and ask your counselor for help if you need it.

[Go to *11.00]

IV. SUMMARY OF PREVIOUS INTERVIEW

*11.00 (Summary, Any Interview After the First, Any Time Through, From Anywhere)

A Here is a summary of your previous time through the interview.

- You 1. Completed
2. Did not complete

the interview as far as the selection of a list of jobs for exploration. You had indicated an interest in and preferences for (the following display is suggestive only, indicating the content of this summary):

CRT	3.	20.	PREVIOUS INTERVIEW; LAST TIME THROUGH; CHOICES				
	4.	31.	"	"	"	"	"
	5.	41A.	"	"	"	"	"
	6.	42A.	"	"	"	"	"
	7.	44.	"	"	"	"	"
	8.	45.	"	"	"	"	"

You said you would not want

	9.	41B.	"	"	"	"	"
	10.	42B.	"	"	"	"	"

and that you felt yourself

	11.	32.	"	"	"	"	"
--	-----	-----	---	---	---	---	---

and hoped to

	12.	43.	"	"	"	"	"
--	-----	-----	---	---	---	---	---

A [if #1 above] The list you obtained from your last interview selection included 13-23, (list from *50.00, previous interview, last time through).

CRT Now you may choose a title from this list, or take one of the choices
A below:

24. Give me list of next 10 jobs
25. Return to beginning of interview

[Inquirer Response]

- I 13-23. → Go to *60.00 for number chosen
24. → Go to next *50.00
25. → Go to *20.00

[if #2 above]

A Because you did not get far enough last time to obtain a list of jobs, you should begin again with the interview and either make the same choices as last time, or revise them.

[Go to *20.00]

V. CYCLED SCRIPTS: INTRODUCTION

*10.00.1 (Introduction, Any Interview After the Third, First Variation)

A Now that you have been through these interviews several times you may already know just how you want to use your time. If not, you may decide when you hear the summary of your last interview. Remember to avoid contradicting yourself whenever you revise your selection of jobs through the interview.
[Go to *11.00]

*10.00.2 (Introduction, Any Interview After the Third, Second Variation)

A You are by now an old hand at using interviews to obtain information about jobs which might suit you. Perhaps you have even had a chance to do some extra homework on the jobs you found interesting last time. That is the way to get more personal and complete information than could be included in the computer storage. Your counselor will gladly help you find the books or arrange interviews which will satisfy your needs. For the time being, continue with your exploration of the jobs here.
[Go to *11.00]

*20.00.1 (Category Selection, Any Interview After the First, First Time, First Variation)

A Here is the list of some factors you may feel are important to you in your consideration of jobs.

CRT [list, as under *20.14]

A

A As you see, you will again be able to use the same choices you made last time by indicating the final alternative listed. If you wish to change any of your choices, however, indicate all of the alternatives which seem important to you. Later, as before, you will be asked to state your requirements in the areas you choose here. These will influence the job list you receive.

I [Process inquirer response, as under *20.14]

[Go to *31.00]

*20.00.2 (Category Selection, Any Interview After the First, First Time, Second Variation)

A Which of the listed categories would you think were important if you were an employer interviewing an applicant for a job? You would want to know whether the person would be qualified to do good work in the job, and whether he, personally, would be happy doing it. As the applicant, you would probably want to know the same things.

CRT [list, as under *20.14]

A Indicate the categories you feel are important. You may choose, also, to keep the selection you made here in your last interview. If so, indicate the number 6 only.

I [Process inquirer response, as under *20.14]

[Go to *31.00]

*20.00.3 (Category Selection, Any Interview After the First, First Time, Second Variation)

A Which of these categories do you feel are important considerations to make when choosing a job?

CRT [list, as under *20.14]

A

A You will have a chance later to indicate your requirements within the areas you choose here. If you want your previous interview choices retained, indicate number 6 on the list. Remember that you may return as often as you like to revise any of your selections in the interview.

I [Process inquirer response, as under *20.14]

[Go to *31.00]

*20.04.1 (Category Selection, Any Interview After the First, Any Time, First Variation)

A Here again is the first selection of categories. Your choice is among five aspects of work which you might consider important in planning your career.

CRT [list, as under *20.14]

A Which of them would you want to consider? If you feel the same as last time about the categories, you may elect to retain your previous choices.

I [Process inquirer response, as under *20.14]

[Go to *31.00]

*20.04.2 (Category Selection, Any Interview After the First, Any Time, Second Variation)

A You want to revise your interview again. Good. You may begin by reconsidering the list of general job requirement areas.

CRT [list, as under *20.14]

A Do you wish to change your selection this time? If so, choose those aspects you want to discuss in greater detail later. If not, indicate choice 6, and your earlier selection will be applied again.

I [Process inquirer responses, as under *20.14]

[Go to *31.00]

*20.04.3 (Category Selection, Any Interview After the First, Any Time, Third Variation)

A You are back again at the start of the selection process. Here is the first list from which you can choose your preferences. In this case, choose those categories which you would consider when planning your career or looking for a job.

CRT [list, as under *20.14]

I [Process inquirer response, as under *20.14]
[Go to *31.00]

*20.04.4 (Category Selection, Any Interview After the First, Any Time, Fourth Variation)

A Here again is your first set of alternatives. Choose as many of these as you feel would influence your choice of a job. You will be asked to state your requirements in these areas later on in the interview.

CRT [list, as under *20.14]

I [Process inquirer response, as under *20.14]
[Go to *31.00]

*20.04.5 (Category Selection, Any Interview After the First, Any Time, Fifth Variation)

A The first set of alternatives, as you may recall, contains aspects of jobs which will affect your decision to enter a job. Not all of them will seem important to you. Indicate those which are. Indicate as many as you wish, or "6" if you wish a repetition of your previous selection.

CRT [list, as under *20.14]

I [Process inquirer responses, as under *20.14]
[Go to *31.00]

*31.00.1 (Activities Selection, Any Interview After the First, Any Time, First Variation)

CRT [list, as under *31.12]

A Now you see five pairs of alternative activities you might be expected to do in a job. Choose one of the alternatives from each pair if you have a definite preference for that kind of activity. Do not choose both alternatives of the same pair or you will eliminate all jobs from your list. If you have no feeling about either alternative, indicate nothing for that pair.

I [Process inquirer responses, as under *31.12]
[Go to *32.00]

*31.00.2 (Activities Selection, Any Interview After the First, Any Time, Second Variation)

CRT [list, as under *31.12]

A The five pairs of alternatives on the screen now are types of work activities which might be involved in a job you hold someday. You have made several selections from the list before and know that this question requires some self-evaluation. Go through them again carefully, and remember, don't indicate both alternatives of the same pair. If you like (or dislike) both alternatives of the same pair just leave that pair unanswered.

I [Process inquirer responses, as under *31.12]
[Go to *32.00]

*31.00.3 (Activities Selection, Any Interview After the First, Any Time, Third Variation)

CRT [list, as under *31.12]

A Once again, choose one of the alternatives from each pair of activities about which you have some feeling of preference. Do not pick both parts of the same pair even if you like them both. Leave that pair blank, and also those you have no feeling about one way or another.

I [Process inquirer responses, as under *31.12]
 [Go to *32.00]

*32.00.1 (Aptitudes Selection, Any Interview After the First, Any Time, First Variation)

A Think carefully about yourself again, and decide in which of the listed areas you are stronger or weaker than most of your classmates. If you think you are about average in any area leave it blank. You know, of course, that you can always come back and change your selection if you change your mind.

CRT [list, as under *32.12]

I [Process inquirer responses, as under *32.12]
[Go to *41.00]

*32.00.2 (Aptitudes Selection, Any Interview After the First, Any Time, Second Variation)

A These are, again, areas in which you may or may not have some ability, or you may be about average. If you feel you are average, make no indication for that area. Otherwise, indicate where you are better than most of your classmates, or where you are not as good as most. Later, you may come back and change your choices again if you want.

CRT [list, as under *32.12]

I [Process inquirer responses, as under *32.12]
[Go to *41.00]

*32.00.3 (Aptitudes Selection, Any Interview After the First, Any Time Through, Third Variation)

CRT [list, as under *32.12]

A Among the alternatives listed, in which areas do you think you are better or worse than most people your age? Indicate as many as you wish. Leave blank all the areas you feel you have average ability in, and don't forget, this is not an easy selection to make and you can come back as often as you wish to change it.

I [Process inquirer responses, as under *32.12]
[Go to *41.00]

*32.00.4 (Aptitudes Selection, Any Interview After the First, Any Time Through, Fourth Variation)

A The talents and abilities people have often determine their success in the job they choose. If you feel you have special strengths or weaknesses in any of the areas listed you should indicate them here. You may feel you are more average in some areas than you are strong, or weak. If so, indicate nothing for that area. You can always return, as you have been doing, to revise your selections.

CRT [list, as under *32.12]

I [Process inquirer responses, as under *32.12]

[Go to *41.00]

*41.00.1 (Physical Demands Selection, Any Interview After the First, Any Time Through, First Variation)

[if no response to item 1 on *20.00 or *20.04, go to *42.00]

A In the beginning of this set of selections you stated that the Physical Demands of a job were important to you.

What is the heaviest lifting and carrying you would consider doing?

CRT [list A, as under *41.12]

A Which of these activities would you want to exclude from your work?

CRT [list B, as under *41.12]

I [Process inquirer responses, as under *41.12]

[Go to *42.00]

*41.00.2 (Physical Demands Selection, Any Interview After the First, Any Time Through, Second Variation)

[if no response to item 1 on *20.00 or *20.04, go to *42.00]

A You said earlier that you would like to impose some personal requirements on the physical activities a job might demand of you.

What is the heaviest lifting and carrying you would consider doing?

CRT [list A, as under *41.12]

A Which activities would you definitely not want to do?

CRT [list B, as under *41.12]

I [Process inquirer responses, as under *41.12]

[Go to *42.00]

*42.00.1 (Working Conditions Selection, Any Interview After the First, Any Time, First Variation)
 [if no response to item 2 of *20.00 or *20.04, go to *43.00]
A Here is the list of working conditions one might have in a
 job. Which of these would you like your job to include?
CRT [list A, as under *42.12]
A Now choose from this second list which conditions you would
 not want your job to include.
CRT [list B, as under *42.12]
I [Process inquirer responses as under *42.12]
 [Go to *43.00]

*42.00.2 (Working Conditions Selection, Any Interview After the First, Any Time, Second Variation)
 [if no response to item 2 of *20.00 or *20.04, go to *43.00]
A Since you stated an interest in the working conditions a job
 might have, choose those from the list which appeal to you.
CRT [list A, as under *42.12]
A Now choose those from the second list which do not appeal to
 you.
CRT [list B, as under *42.12]
I [Process inquirer responses, as under *42.12]
 [Go to *43.00]

*43.00.1 (Education Selection, Any Interview After the First, Any Time Through, First Variation)

[if no response to item 3 of *20.00 or *20.04, go to *44.00]

A Education is perhaps the most important factor to consider in planning a career. You evidently realize this. Although you are probably uncertain about your educational plans at this time, which of the levels listed here would be the highest level you hope to complete?

CRT [list, as under *43.12]

I [Process inquirer responses, as under *43.12]
[Go to *44.00]

*43.00.2 (Education Selection, Any Interview After the First, Any Time Through, Second Variation)

[if no response to item 3 of *20.00 or *20.04, go to *44.00]

A You seem to appreciate the importance of your educational background since you stated an interest in this area earlier. What do you expect will be the highest educational level you will complete? This would, of course, be a guess, and you may not be sure at this stage. Try to answer the question anyway, and later if you wish to change your guess you may come back and do so.

CRT [list, as under *43.12]

I [Process inquirer responses, as under *43.12]
[Go to *44.00]

*44.00.1 (Salary Selection, Any Interview After the First, Any Time Through, First Variation)

[if no response to item 4 of *20.00 or *20.04, go to *45.00]

A Unfortunately, very little data is now available on the wages paid by various jobs. Whatever information there is will be given to you later when you inquire about particular jobs on your list.

First, please indicate which salary level you feel that you would be satisfied with eventually.

CRT [list, as under *44.12]

I [Process inquirer responses, as under *44.12]

[Go to *45.00]

*44.00.2 (Salary Selection, Any Interview After the First, Any Time Through, Second Variation)

[if no response to item 4 of *20.00 or *20.04, go to *45.00]

A If you could choose a certain level of income in which you thought you would be satisfied, which would it be?

CRT [list, as under *44.12]

A You said earlier that salary was an important job factor to you. Specific information on salaries, whenever it exists, will be given later in the descriptions of the jobs on your list.

I [Process inquirer responses, as under *44.12]

[Go to *45.00]

*45.00.1 (Security Selection, Any Interview After the First, Any Time Through, First Variation)

[if no response to item 5 of *20.00 or *20.04, go to "Test 1"]

A Here are four kinds of security a job might be able to offer you.

CRT [list, as under *45.12]

A Which of these would you find appealing? Choose as many as you like.

I [Process inquirer responses, as under *45.12]
[Go to "Test 1"]

*45.00.2 (Security Selection, Any Interview After the First, Any Time Through, Second Variation)

[if no response to item 5 of *20.00 or *20.04, go to "Test 1"]

A You have indicated an interest in the security factors a job might have. Here are several for you to consider. Choose those which appeal to you.

CRT [list, as under *45.12]

I [Process inquirer responses, as under *45.12]
[Go to "Test 1"]